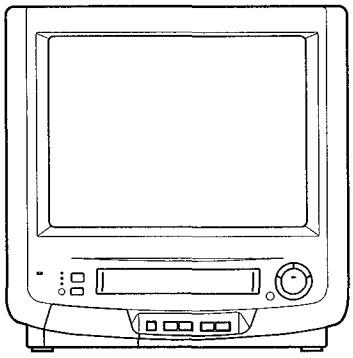
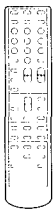
KV-20/13VM30/31

RM-Y138/W

SERVICE MANUAL





US Model

KV-20VM30
chassis No. SCC- J90A-A

KV-13VM30
chassis No. SCC- J90B-A

KV-13VM31
chassis No. SCC- J90C-A

Canadian Model

KV-20VM30
chassis No. SCC-J89A-A

KV-13VM30
chassis No. SCC-J89B-A

MODELS OF THE SAME SERIES	
KV-13VM30/31	KV-20VM30

SPECIFICATIONS

Television system	American TV standard, NTSC COLOR
Channel coverage	VHF: 2-13 UHF: 14-69 CABLE TV: 1-125
Picture tube	Trinitron® Tube 20-inch picture measured diagonally 21-inch picture tube measured diagonally 13-inch picture measured diagonally 14-inch picture tube measured diagonally
Antenna	75Ω external antenna terminal for VHF/UHF
Input	Video In(phono jack) 2 each (Front/Rear): 1 Vp-p, 75-ohms unbalanced negative sync Audio In(phono jack) 2 each (Front/Rear): 400 mVrms (100% modulation) Impedance. 47 kΩ
Output	Headphone Jack
Tape Speed	SP: 33.35 mm/sec. EP· 11.12 mm/sec.
Maximum Recording/playback time	8 hours in EP mode

Speaker Size		48 x 72 mm
Audio frequency response		50 Hz-20kHz
Power requirements		120V AC, 60Hz
Power consumption		86W (KV-13VM30/31) 108W (KV-20VM30)
Fast-forward and rewind time		Approx. 4min 30sec (T-120 Tape)
Dimensions (w/h/d)	13V;	15" x 16" x 15 1/5" 382 x 407 x 411 mm
	20V,	20 1/2" x 20 1/2" x 18 3/5" 522 x 522 x 474 mm
Weight	13V,	Net 13 76kg (33 3lbs) Gross. 15.62Kg (34.4lbs)
	20V,	Net: 26.1 kg (58 lbs) Gross: 30 Kg (66.1 lbs)
Supplied accessories		Remote Commander RM-Y138/W (1) with 1 AA size (R6) battery Antenna Adapter (1)

Design and specifications are subject to change without notice

MICROFILM

TRINITRON® COLOR VIDEO TV

SONY®

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(CAUTION)

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE

WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, DUE TO LIVE CHASSIS THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND ⚠ MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFEOPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED

(ATTENTION)

ARRES AVOIR DECONECTE LE CAP DE L'ANODE, COURT CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE

ATTENTION!!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHEÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISE LORS DE TOUT DÉPANNAGE

LE CHÁSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ Á L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS ALA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MAPQUE ⚠ SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIECES CONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIES DANS LE PRÉSENT MANUEL SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ

SAFETY CHECK-OUT

(US Model only)

After correcting the original service problem, perform the following safety checks before relasing the set to the customer

1. Check the area of your repair for unsoldered or poorly soldered connections Check the entire board surface for solder splashes and bridges.

2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.

3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.

4 Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair Point them out to the customer and recommned their replacement

5 Look for parts which, though functioning, show obvious signs of deterioration Point them out to the customer and recommend their replacement

6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer

7. Check the condition of the monopole antenna (if any).
   Make sure the end is not broken off and has the plastic cap on it.
   Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.

8. Check the B+ and HV to see they are at the values specified . Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV

9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage Check leakage as described below

LEAKAGE TEST

The AC leakage from any exposed metal parts to earth ground and from all exposed metal parts to any exposed metal parts having a return to chassis, must not exceed 0.5 mA(500 microampers) Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers instructions to use these instruments

2. A battery-operated AC milliammeter The Data Precision 245 digital multimeter is suitable for this job

3. Measuring the voltage drop across a resistory by means of a VOM or battery-operated AC voltmeter The "limit" indication is 0 75V, so analog meters must have an accurate low-voltage scale The Simpson 250 and Sanwa SH-63TRD are examples of a passive VOM that is suitable
   Nearly all battery operated digital multimeters that have a 2V AC range are suitable (See Fig A)

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground, the cover plate retaining screw on most AC outlet boxes is also at earth ground If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a coldwater pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60-100 watts trouble light (not a neon lamp) between the hot side of the line, the lamp shojuld light at normal brilliance if the screw is a ground potential (See Fig. B)

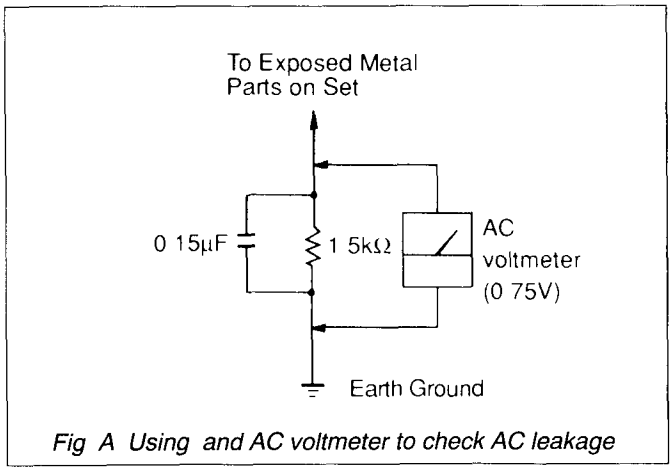


Fig A Using and AC voltmeter to check AC leakage

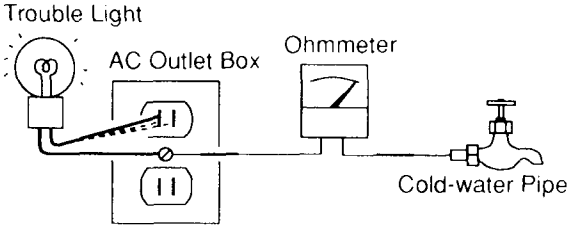
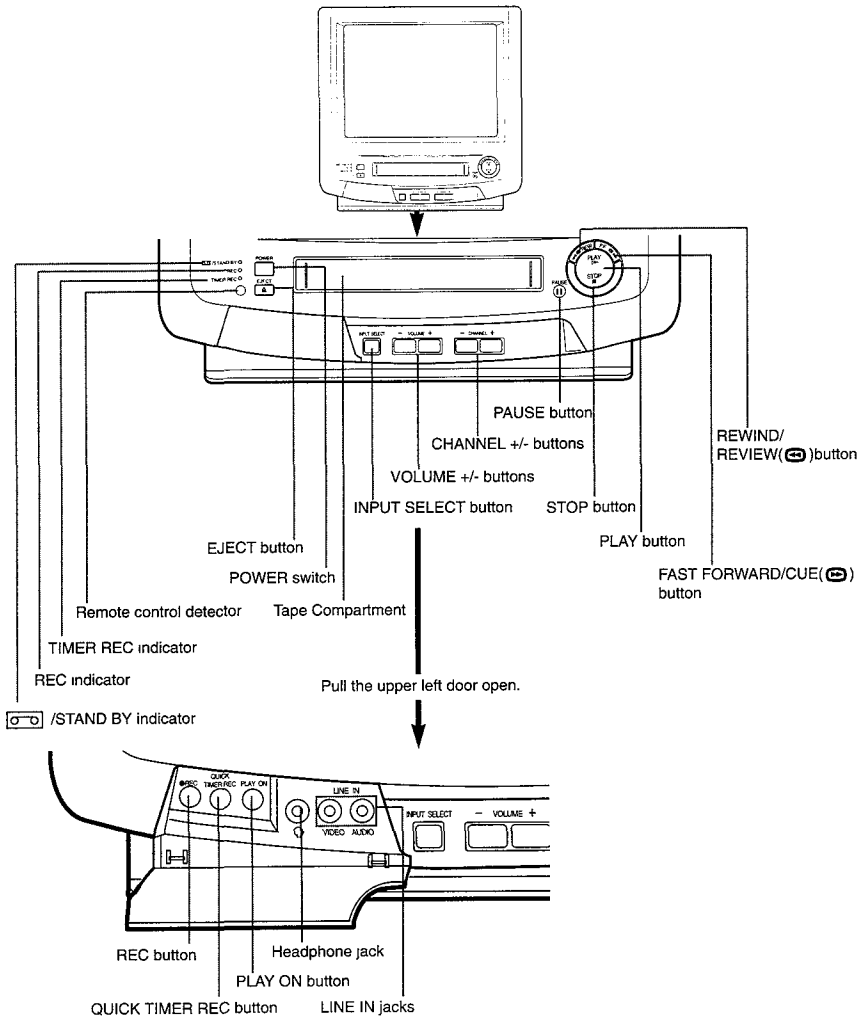


Fig B Checking for earth ground

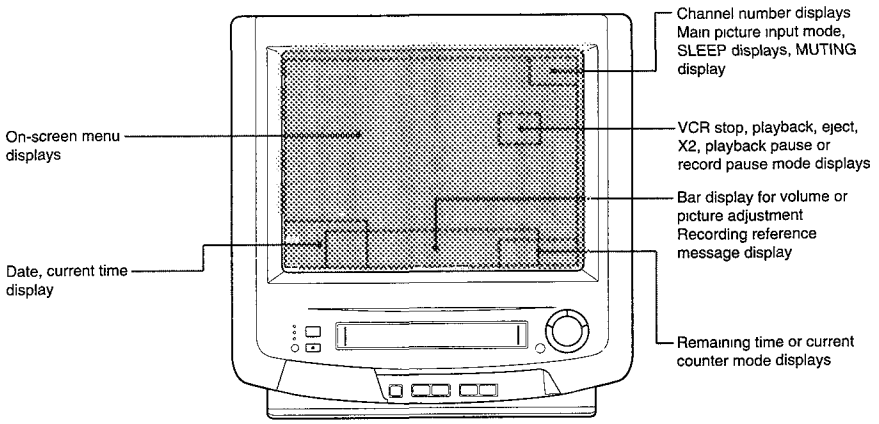
SECTION 1
GENERAL

1-1. LOCATING THE CONTROLS

Front Panel



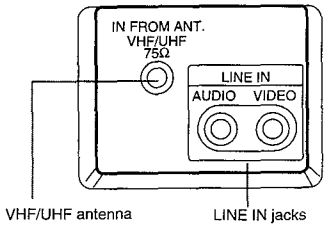
Screen Displays



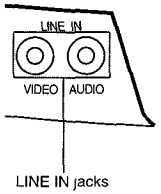
LOCATING THE CONTROLS

Rear and Front Panel

- **Rear Panel**

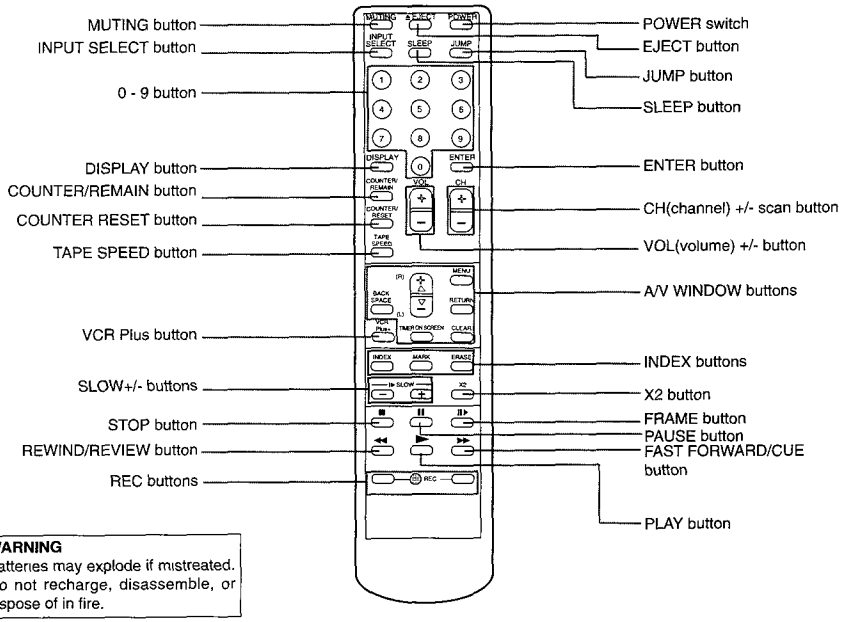


- **Front Door Inside**



Remote Commander

RM-Y138/W



WARNING
Batteries may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

1-2. CONNECTING TV ANTENNA/CABLE

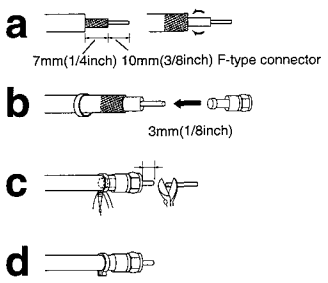
Although you can use either an indoor or outdoor antenna with the VIDEO TV, an outdoor antenna will provide you with better picture quality. You can receive cable TV by connecting a cable supplied by your local cable company.

Connecting VHF, UHF or VHF/UHF Combination Antenna, or CATV Cable

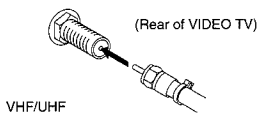
75-ohm coaxial cable (round)

1 Check your antenna cable type and prepare the end of the cable using the F-type connector.

Attach an F-type connector (not supplied).



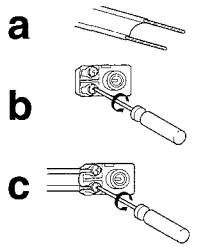
2 Plug the connector into the VHF/UHF terminal at the rear of the VIDEO TV.



300-ohm twin-lead cable (flat)

1 Check your antenna cable type and prepare the end of the cable using the 300-ohm twin-lead cable.

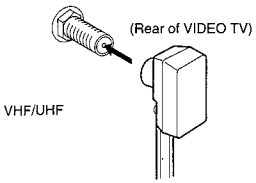
Attach the supplied antenna connector.



Loosen both screws on the connector with screwdriver.

Attach the cable and tighten both screws with a screwdriver.

2 Plug the connector into the VHF/UHF terminal at the rear of the VIDEO TV.



* Most combination antennas are equipped with a signal splitter.
Remove the splitter and attach the appropriate connector.

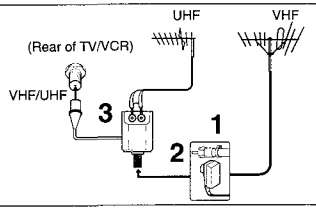
Connecting Both VHF and UHF Antennas

Use the EAC-66 U/V mixer (not supplied).

1 Prepare the VHF antenna end using the appropriate connector (p. 8).

2 Connect the cables to the mixer.

3 Attach the mixer to the VHF/UHF terminal.



When the U/V mixer is used
Snow and noise may appear in the pictures when viewing cable TV channels over 37 (W + 1).

Note

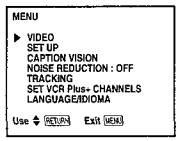
For better picture quality, we would recommend you to connect an outdoor antenna.

1-3. USING THE ON-SCREEN MENUS

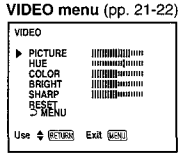
The following flow chart shows the different levels of on-screen menus that you can use to make various adjustments and settings. See the indicated pages for instructions on using each feature.

For picture quality adjustment

Main menu

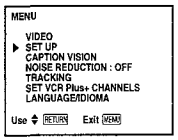


VIDEO menu (pp. 21-22)

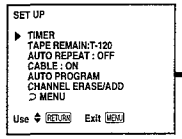


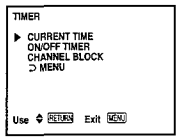
For presetting and other functions

Main menu

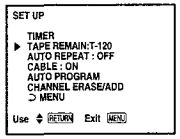


SET UP menu
(pp. 12-17, 25-29)

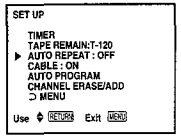




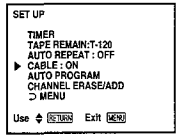
TIMER screen (pp. 25-35)



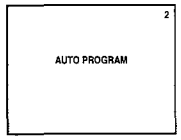
TAPE REMAIN screen (p. 42)



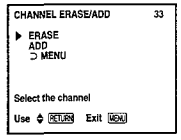
AUTO REPEAT ON/OFF screen (p. 39)



CABLE ON/OFF screen (p. 12)



AUTO PROGRAM screen (pp. 13-14)

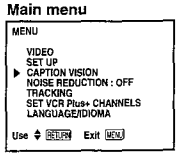


CHANNEL ERASE/ADD screen (pp. 15-17)

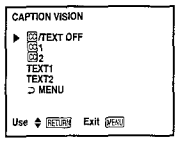
USING THE ON-SCREEN MENUS

For closed caption setting

Main menu



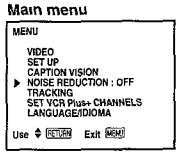
CAPTION VISION menu



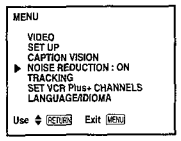
CAPTION VISION screen (p. 23)

For noise reduction function

Main menu



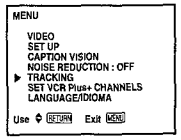
NOISE REDUCTION menu



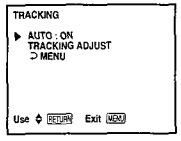
NOISE REDUCTION screen (p. 24)

For tracking adjustment function

Main menu



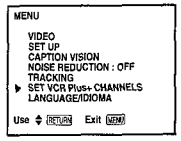
TRACKING menu



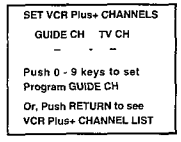
TRACKING screen (p. 41)

For VCR Plus+ CHANNELS setting

Main menu



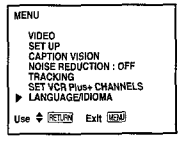
SET VCR Plus+ CHANNELS menu



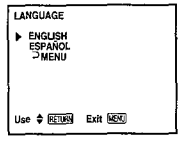
SET VCR Plus+ CHANNELS screen (p. 44-46)

For on screen language selection function

Main menu



LANGUAGE SELECTION menu



To select the LANGUAGE/IDIOMA

Press △ + or ▽ - to select the desired language mode. And, press RETURN.

Navigating Through the Menus

Use the buttons on the remote commander.

To display the main menu
Press MENU.

To return to the normal screen
Press MENU on the Remote Commander.

To return to the previous menu
Press △+ or ▽- to select MENU. Then press RETURN.

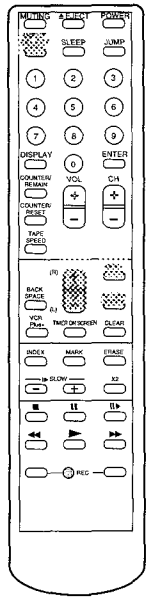
To return to the main menu
Repeat the above, until you reach the main menu.

Note

The menus disappear automatically if you do not press a button within 60 seconds.

1-4. TURNING THE CABLE MODE ON OR OFF

All of the controls are on the Remote Commander.



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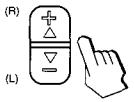
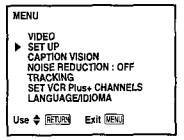
To return to the normal screen
Press MENU.

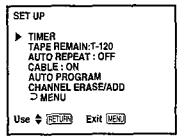
If you have cable connected to your VIDEO TV (p. 8-9) follow the steps below to turn the cable connection on or off. CABLE is preset to OFF when you use your VIDEO TV for the first time. Turn CABLE to OFF to preset or watch VHF or UHF channels.

1 Press MENU.
The Main Menu appears
Press △+ or ▽- to select SET UP, in main menu.

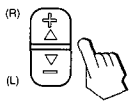


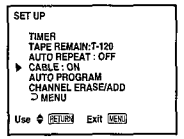


Press RETURN.
The SET UP menu appears.



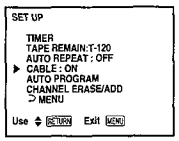
2 Press △+ or ▽- to select CABLE.

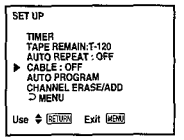




Press RETURN.

3 Press △+ or ▽- to select ON or OFF alternately.





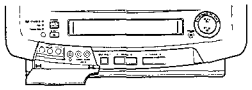
Press RETURN.
The setting is completed.

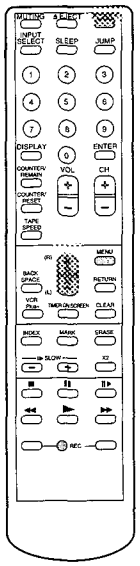
Note

If the VIDEO TV is in LINE mode, you cannot select CABLE. Repeatedly press INPUT SELECT to change to TV mode.

1-5. PRESETTING TV CHANNELS

Once you have preset the channels on your VIDEO TV, you will be able to use the channel +/- buttons on the VIDEO TV or the Remote commander to scan the channel you selected.





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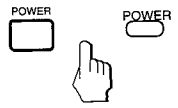
Presetting TV Channels Automatically

Note

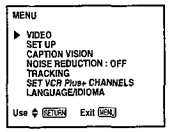
Perform auto programming during the day rather than late at night, when some channels may not be broadcasting.

1 Press POWER on the VIDEO TV or the Remote Commander to turn the VIDEO TV on.

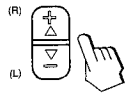


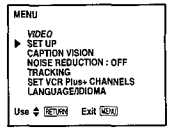
2 Using the Menu, select cable off to receive VHF/UHF channel. Select cable on to receive cable stations.
(Follow the steps in "Turning the Cable Mode On or Off", p. 12.)

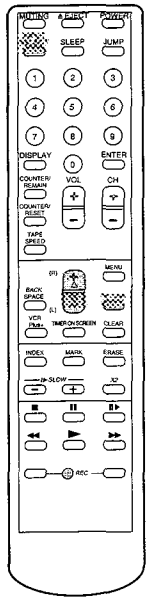
3 Press MENU.
The main menu appears.



4 Press △+ or ▽- to select SET UP.







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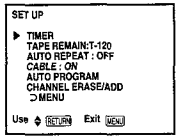
Receivable channels for this TV
VHF: 2-13
UHF: 14-69
Cable: 1-125

To select TV channels without presetting
Press 0-9.

To return to the normal screen
Press MENU.

To erase unnecessary channels, or to add channels that could not be preset automatically because their signal was too weak, follow the steps in "Erasing Unnecessary Channels CHANNEL ERASE" and "Presetting Only Desired Channels-CHANNEL ADD" (pp. 15-17).

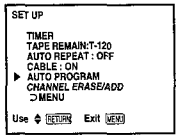
Press RETURN.
The SET UP menu appears.



Note

If the VIDEO TV is in LINE mode, you cannot select AUTO PROGRAM. Press INPUT SELECT to change to TV mode.

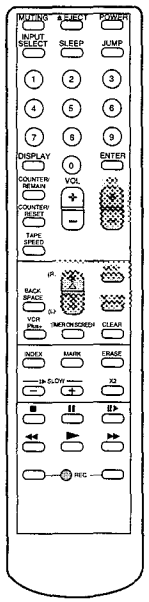
5 Press △+ or ▽- to select AUTO PROGRAM.



Press RETURN.

"AUTO PROGRAM" appears on the screen and receivable channels (other than the channels already preset) are preset in numerical sequence. The channels previously preset will not remain in the TV's memory.
When no more channels can be found, the programming stops and the lowest numbered channel is displayed.

PRESETTING TV CHANNELS



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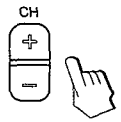
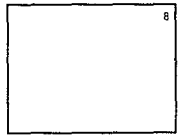
Erasing Unnecessary Channels - CHANNEL ERASE

Use this feature to erase unnecessary TV channels, so that when you press CH+/-, the channel(s) are skipped.

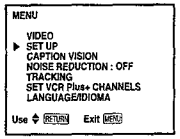
1 Press the CH +/- button to select the channel you want to erase.
For example, to erase channel 8, press CH + or - until 8 appears.



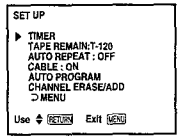


2 Press MENU.
The main menu appears.

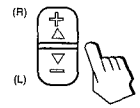
3 Press △+ or ▽- to select SET UP

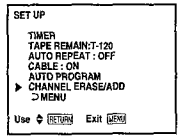


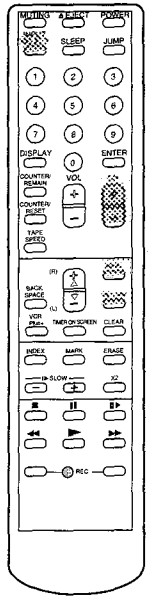
Press RETURN.
The SET UP menu appears.



4 Press △+ or ▽- to select CHANNEL ERASE/ADD.







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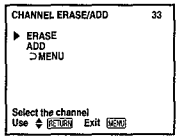
To return to the normal screen
Press MENU.

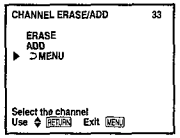
Press RETURN.
The CHANNEL ERASE/ADD screen appears, and the cursor points to ERASE.



Note

If the VIDEO TV is in LINE mode, you cannot select CHANNEL ERASE/ADD. Press INPUT SELECT to change to TV mode.

5 Press RETURN.
A "-" sign appears in front of the channel number display showing that the channel is erased from the channel scan memory.

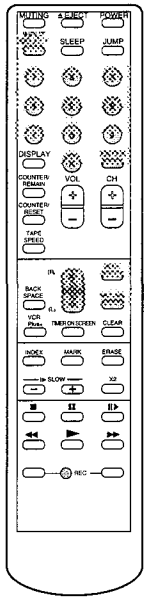


6 Press MENU.

The next time you press the CH +/- buttons, channel 8 will be skipped.

To erase other channels
Repeat steps 1-6.

PRESETTING TV CHANNELS



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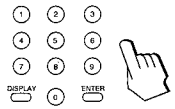
To return to the normal screen
Press MENU.

Presetting Only Desired Channels - CHANNEL ADD

Use this feature to add channels one at a time to the channel scan memory.

1 Press 0-9 to select the channel you want to add. For example, to add channel 25, Press 2, 5 and ENTER.

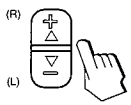


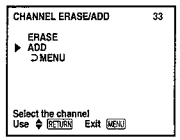
2 - 4 (Follow steps 2-4 in "Erasing Unnecessary Channels-CHANNEL ERASE," pp. 15-16)

Note

If the TV is in LINE mode, you cannot select CHANNEL ERASE/ADD. Press INPUT SELECT to change to TV mode.

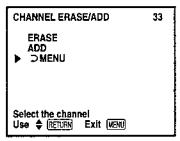
5 Press △+ or ▽- to select ADD.





Press RETURN.

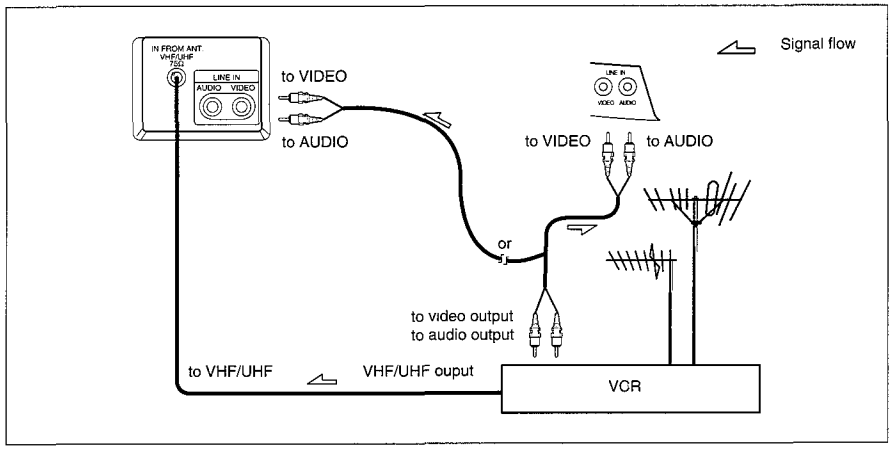
A "+" sign appears in front of the channel number display showing that the channel is added to the channel scan memory.



6 Press MENU.

To add other channels
Repeat steps 1-6.

1-6. CONNECTING OTHER EQUIPMENTS



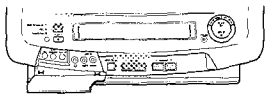
1 Remove the antenna cable from the VIDEO TV Antenna terminal. Connect the antenna cable to the antenna terminal of the other Video/Audio source (ex. Video recorder). Then connect a coaxial cable from the VHF output terminal back to the antenna terminal of the VIDEO TV.

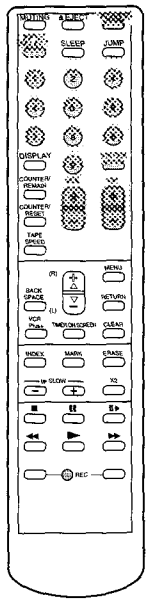
2 To use your VIDEO TV to monitor an audio/video source (such as another VCR, a Camcorder or a Laser Disc Player), connect the audio/video source output jacks to the AUDIO/VIDEO IN jacks on the rear panel or front door of the VIDEO TV.
Then select LINE IN using the PLAY ON on the front door.

Notes

- Press PLAY ON on the front door of the VIDEO TV so that ° LINE°appears on the screen.
- To return to TV mode, repeatedly press INPUT SELECT on the VIDEO TV or on the Remote Commander so that a channel number appears on the screen.
- For operating instructions, refer to the instruction manual furnished with the VCR.
- If the picture or sound is affected, move the VCR away from the VIDEO TV.

1-7. WATCHING TV PROGRAMS





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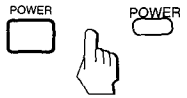
1 Press POWER on the VIDEO TV or the Remote Commander to turn the TV on.

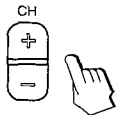


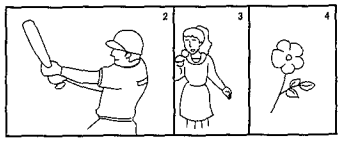
2 Turn the cable mode on or off to select the type of channel you want to watch, VHF/UHF or cable TV.
(Follow the steps in "Turning the Cable Mode On or Off," p.12.)

If "LINE" is displayed on the screen, press INPUT SELECT on the Remote Commander so that the channel number appears.

3 Select a channel in one of the following two ways:

To scan the preset channels* in numerical sequence
Press CH +/-

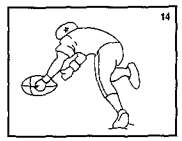




* For more information on presetting channels, see pp. 13-17.

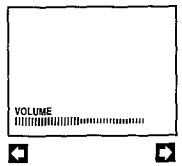
To select a channel directly
Press 0-9.
For example, to select channel 14, press 1 and 4.

You don't have to press ENTER after having pressed the desired channel number. The channel is directly selected if you do not press ENTER after 3 seconds.
But press ENTER to select a channel quickly.



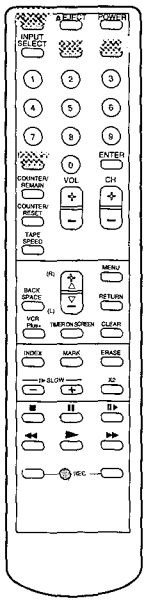
4 Press VOL +/- to adjust the volume.

Press VOL + to increase the volume.
Press VOL - to decrease the volume.



To turn off the TV
Press POWER on the TV or the Remote Commander again.

1-8. USING CONVENIENT FEATURES



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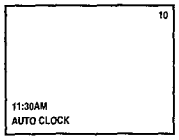
Muting the Sound - MUTING

Press MUTING.
The display "MUTING" will appear on the screen.

To restore the sound
Press MUTING again.

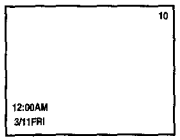
Keeping the Displays On-Screen - DISPLAY

If AUTO CLOCK has been set when you turn the VIDEO TV on, the display will appear for about 3 seconds as shown right.



To display the channel
Press DISPLAY.
All the existing displays appear: channel number, date, time, VCR operating mode and tape counter.

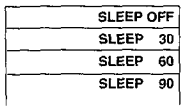
To cancel the display
Press DISPLAY again.
The display will disappear.



Setting the Sleep Timer - SLEEP

The sleep timer turns off the TV automatically after the amount of time you select.

Press SLEEP
Each time you press SLEEP, the time increments 30, 60, 90 and OFF mode appear in sequence.



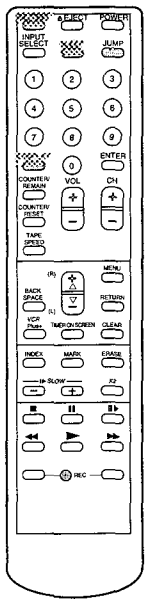
The SLEEP display appears about one minute before the TV turns off.

To cancel the setting
Press SLEEP untill OFF mode appears.
The "SLEEP OFF" display appears for about three seconds.
OR
Turn the TV off.
The sleep timer setting is cancelled.

Switching Quickly Between Two Channels - JUMP

Press JUMP once to recall the channel you were watching previously. Press JUMP again to switch back. Use this feature to keep track of two programs alternately.

1-9. ADJUSTING PICTURE QUALITY



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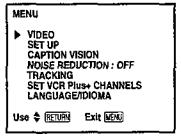
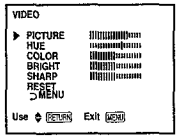
You can adjust the picture for each input mode (TV mode, LINE) by pressing INPUT SELECT to select the input mode before making the adjustments.
These adjustments are retained in memory even when you turn off the TV until you change the adjustments again.

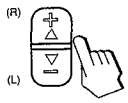
1 Press MENU.
The main menu appears, and the cursor points to VIDEO.

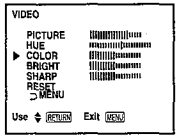


2 Press RETURN.
The VIDEO menu appears.

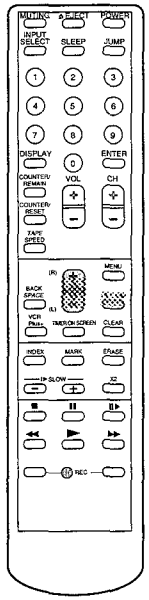


3 Press △+ or ▽- to select the item you want to adjust.
For example, to adjust the picture color, select *COLOR*.





Press RETURN.
The adjustment bar appears.



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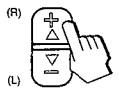
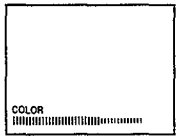
To return to the normal screen
Press MENU.

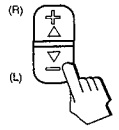
To restore the factory (mid-level) setting
Go to the VIDEO menu and select RESET by pressing △+ or ▽- Then press RETURN. All the settings except for PICTURE will be restored to mid-level settings.

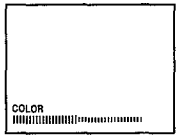
4 Press △+ or ▽- to make the adjustment.





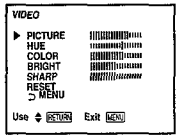
Increase color intensity ■





■ Decrease color intensity

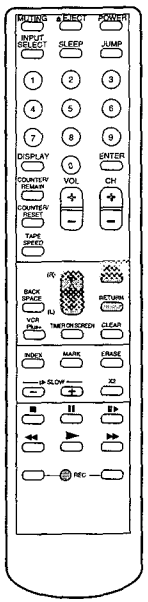
Press RETURN.
The new setting appears in the VIDEO menu.



To adjust other items
Repeat steps 3-4.

	Press ▽ - to	Press △ + to
PICTURE	decrease picture contrast with soft color	increase picture contrast with vivid color
HUE	make skin tones become purplish	make skin tones become greenish
COLOR	*decrease color intensity*	*increase color intensity*
BRIGHT	darken the picture	brighten the picture
SHARP	soften the picture	sharpen the picture

1-10. USING CLOSED CAPTION



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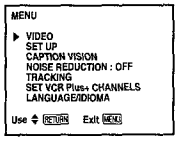
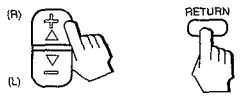
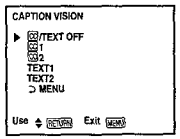
1 Press MENU.
The main menu appears.



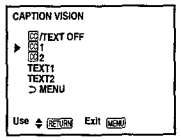
2 Press △+ or ▽- to select CAPTION VISION.
Then press RETURN.
The CAPTION VISION screen appears.



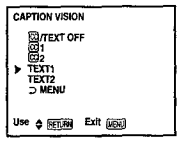


3 Press △+ or ▽- to select closed caption mode.

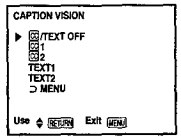
Select CC1 or CC2 to view Captions.
A Caption is a printed version of the dialogue or sound effects of a program. (The mode should be set to CC1 for most programs.)



Select TEXT1 or TEXT2 to view Text.
Text is information that is presented using the full to full television screen.
It is usually not related to the program.



Select CC/TEXT OFF if you do not want to use the CAPTION VISION mode.

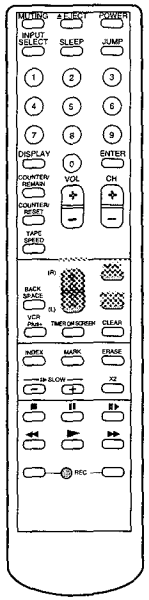


Press RETURN.
The Setting is completed.

Note

Captions may appear with a white box or another error instead of a certain word. Poor reception of TV programs can also cause errors in Closed Caption.

1-11. USING NOISE REDUCTION FUNCTION



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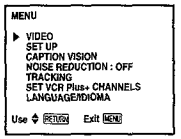
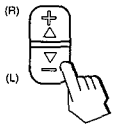
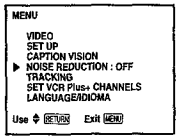
You can reduce the picture noise on the screen in VCR playback mode.

1 Press MENU.
The main menu appears, and the cursor points to VIDEO.

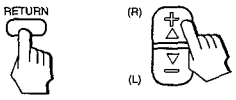


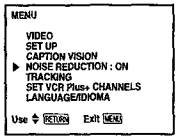
2 Press △+ or ▽- to select NOISE REDUCTION.





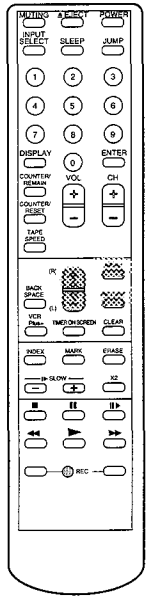
3 Press RETURN, then △+ or ▽- to select ON.





4 Press RETURN.
The picture noise is reduced.

1-12. USING THE TIMER-ACTIVATED FUNCTIONS



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Notes

- The clock cannot be set automatically if you don't receive a channel that carries a time signal in your area. If so, set the clock manually (pp28-29).
- If there are only a few channels in your area that carry time signals, setting the clock automatically may take up to about 30 minutes. If nothing happens even after you wait about 30 minutes, set the clock manually.
- The menu disappears automatically if you don't proceed for more than one minute.

Setting the Clock - AUTO CLOCK SET

Before you use the timer feature for recording program, you need to set the current time and date.

Some TV and cable channels have started to transmit time signals with their broadcasts. Your VIDEO TV can pick up this time signal to automatically set the clock. After completing the steps below, when you turn off the VIDEO TV, it will automatically search for a channel that carries a time signal and set the clock. The Auto Clock Set feature only works if a channel in your area is broadcasting a time signal. If broadcasters in your area are not yet sending time signals, set the time manually (PP28 - 29).
Clock setting is necessarry also to use ON/OFF TIMER, CHANNEL BLOCK, Timer Recording and VCR Plus Recording.

1 Press MENU.
The main menu appears.

MENU
▶ VIDEO
SET UP
CAPTION VISION
NOISE REDUCTION : OFF
TRACKING
SET VCR Plus+ CHANNELS
LANGUAGE/IDIOMA
Use ◆ RETURN Exit MENU

2 In main menu, press △+ or ▽- to select SET UP
Then press RETURN.
The SET UP screen appears.

SET UP
▶ TIMER
TAPE REMAIN:T-120
AUTO REPEAT : OFF
CABLE : OFF
AUTO PROGRAM
CHANNEL ERASE/ADD
⊃MENU
Use ◆ RETURN Exit MENU

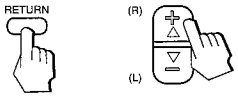
3 Press △+ or ▽- to select TIMER.
Press RETURN.
The TIMER screen appears.

TIMER
▶ CURRENT TIME
ON/OFF TIMER
CHANNEL BLOCK
⊃MENU
Use ◆ RETURN Exit MENU

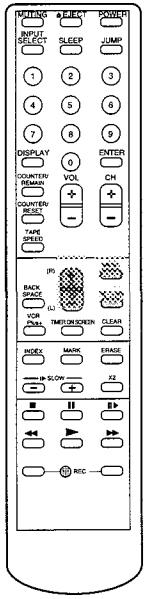
4 Press △+ or ▽- to select CURRENT TIME.
Press RETURN.
The CURRENT TIME screen appears.

CURRENT TIME
▶ AUTO MANUAL
⊃MENU
Use ◆ RETURN Exit MENU

5 Press RETURN then select AUTO by using △+ or ▽-
Press RETURN again.
The Auto Clock Set screen appears.



CURRENT TIME
▶ FULL AUTO OPTIONS
⊃MENU
Use ◆ RETURN Exit MENU



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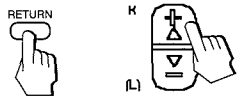
6 Press RETURN then select FULL AUTO by using △+ or ▽-
Press RETURN again.



When clock data service is available, the clock is set automatically with leaving the TV off

7 To activate the Auto Clock Set function, turn the TV off.

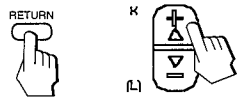
The VIDEO TV automatically sets the clock.
The VIDEO TV automatically searches for a channel that carries a time signal and sets your time zone and daylight saving time (if applicable). If your clock sets, but displays the wrong time zone or daylight saving time, you can adjust these settings by following the steps below.

If the clock is not activated

1 Follow steps 1 to 5 above.

2 Press RETURN then select OPTIONS by using △+ or ▽-
Press RETURN again.

The CURRENT TIME SET CH screen appears.



CURRENT TIME SET CH
▶ AUTO MANUAL
[CH---]
Use ◆ RETURN Exit MENU

3 Press RETURN, then press △+ or ▽- to select AUTO or MANUAL.

If you select AUTO:
The VIDEO TV automatically searches for a channel that carries a time signal.

CURRENT TIME SET CH
▶ AUTO MANUAL
[CH---]
Use ◆ RETURN Exit MENU

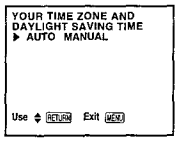
If you select MANUAL.
Set a channel that carries a time signal using the number buttons.
Use this option if you know that channel. Most PBS member stations broadcast a time signal. For the fastest response, set the VIDEO TV to your local PBS station.

CURRENT TIME SET CH
▶ AUTO MANUAL
[CH---]
Push 0-9 keys to set CURRENT TIME for clock
Then push RETURN
Use ◆ 0-9 Exit MENU

USING THE TIMER-ACTIVATED FUNCTIONS

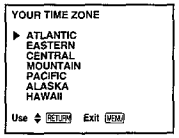
4 Press RETURN.

The YOUR TIME ZONE AND DAYLIGHT SAVING TIME screen appears.

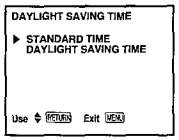


5 Press RETURN, then press △+ or ▽- to select AUTO or MANUAL.

If you select AUTO:
The VIDEO TV automatically sets your time zone and daylight saving time (if applicable).



If you select MANUAL.
1. Press RETURN, then set the time zone of your area using △+ or ▽-
2. Press RETURN, then select STANDARD TIME or DAYLIGHT SAVING TIME using △+ or ▽-

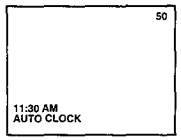


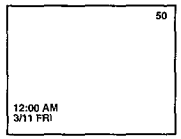
6 Press RETURN.

7 To activate the Auto Clock Set function, turn the TV off.

Notes

- If AUTO CLOCK has been set when you turn the VIDEO TV on, the display will appear as shown right. When the display does not appear as shown right even though AUTO CLOCK has been set: using the Manual Clock Set stops the automatic channel search when your set is power off. If the Auto Clock Set feature is not in use, the channel search is not performed when your set is power off.
- If you set the clock manually, the display will appear as shown right.

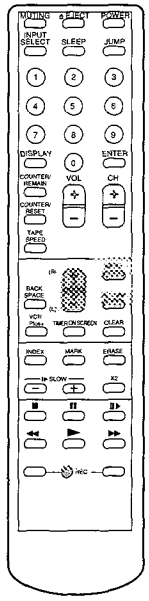




Notes

- Select STANDARD, if the DAYLIGHT SAVING TIME is not performed in your area.
- When you connect another VCR to the VHF/UHF antenna terminal, if VCR's tape is transmitted wrong time signal, your VIDEO TV automatically sets the clock by the time signal of the tape.

  Not to set the clock by the time signal of VCR:
  Turn your VIDEO TV off after having tunned VCR off or Set the clock manually on your VIDEO TV.



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To change or correct the setting before completing it
Press BACK SPACE to return to the item to be erased.

Setting the Clock - MANUAL CLOCK SET

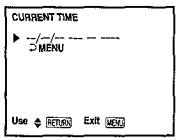
EXAMPLE:
Set the time to 11:30AM, Sunday on the 25th of February, 1996.

1 In main menu, press △+ or ▽- to select SET UP
Then press RETURN.
The SET UP screen appears.

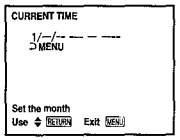
2 Press △+ or ▽- to select TIMER.
Press RETURN.
The TIMER screen appears.

3 Press △+ or ▽- to select CURRENT TIME.
Press RETURN.
The CURRENT TIME screen appears.

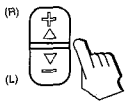
4 Press RETURN then select MANUAL by using △+ or ▽-
Press RETURN.
The Manual Clock Set screen appears.

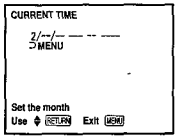


5 Press RETURN.
""Set the month" appears on the screen.
The month will appear in red.

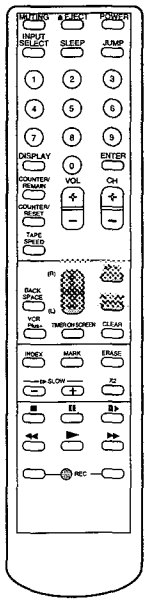


6 Press △+ or ▽- to set the month.
Each time you press △+ or ▽- the month changes in sequence.





USING THE TIMER-ACTIVATED FUNCTIONS



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To display the time
Press DISPLAY.

To return to the normal screen
Press MENU.

Notes

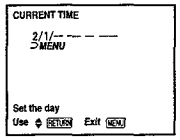
- The internal clock of this VIDEO TV operates on a 12-hour cycle.

  12:00 AM stands for midnight.
  12:00 PM stands for noon.

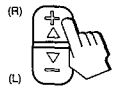
- All the settings including CLOCK will be erased if you unplug the VIDEO TV or a power failure occurs. Reset the current time by following steps 1-11.

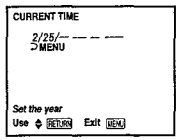
- You cannot change the clock during Timer Recording. To change the clock, stop the recording.

7 Press RETURN.
"Set the day" appears on the screen.

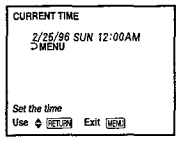


8 Press △+ or ▽- to set the day.
Each time you press △+ or ▽-, the day changes consecutively.
Press RETURN.
"Set the year" appears on the screen.

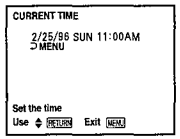




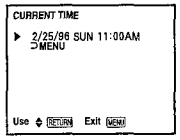
9 Press △+ or ▽- to set the year.
Each time you press △+ or ▽-, the year changes in sequence and the day of the week automatically changes.
Press RETURN.
"Set the time" appears on the screen.

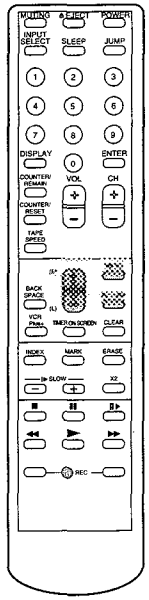


10 Press △+ or ▽- to set the hour.
Each time you press △+ or ▽-, the hour changes in sequence starting with "12:00AM."
Press RETURN.



11 Press △+ or ▽- to set the minute.
Each time you press △+ or ▽-, the minute changes in sequence.
Press RETURN.
The setting is completed and the clock starts.





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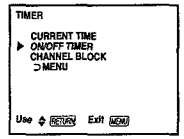
Setting the ON/OFF TIMER

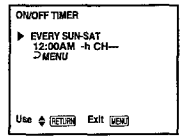
With this function you can set your favorite program to appear on the screen at the time that you set.
EXAMPLE: Set the timer to turn on the VIDEO TV every Monday through Friday at 3:15 PM for 2 hours, on channel 21.

1 In main menu, press △+ or ▽- to select SET UP
Then press RETURN.
The SET UP screen appears.

2 Press △+ or ▽- to select TIMER.
Press RETURN.
The TIMER screen appears.



3 Press △+ or ▽- to select ON/OFF TIMER.
Press RETURN.
The ON/OFF TIMER screen appears.

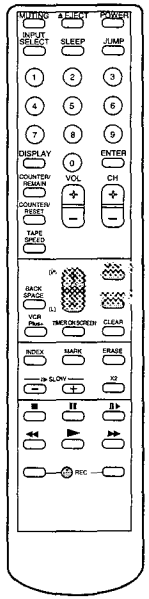


Note

If the ON/OFF TIMER display does not function, the current time has not been set and you cannot select ON/OFF TIMER. To set the clock, see "Setting the Clock-AUTO CLOCK SET/MANUAL CLOCK SET," PP 25-29.

4 Press RETURN.
""Set the day" appears on the screen.
"EVERY SUN-SAT" will be changed in red.

USING THE TIMER-ACTIVATED FUNCTIONS



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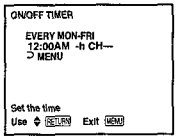
5 Press △+ or ▽- to set the day.

Each time you press △+ or ▽-, the days of the week change as shown in Fig. 1 (page 32).

Then press RETURN.

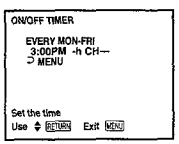
"Set the time" appears on the screen.



6 Press △+ or ▽- to set the hour that you want the TIMER to start.

Each time you press △+ or ▽-, the hour changes in sequence.

Then press RETURN.

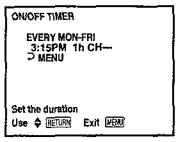


7 Press △+ or ▽- to set the minutes.

Each time you press △+ or ▽-, the minutes change in sequence.

Then press RETURN.

"Set the duration" appears on the screen.

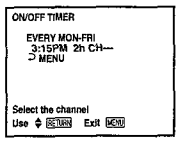


8 Press △+ or ▽- to set the duration of time.

Each time you press △+ or ▽-, the duration changes from "1" to "9" in sequence.

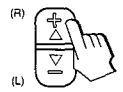
Then press RETURN.

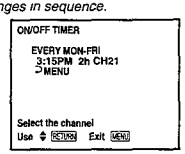
"Select the channel" appears on the screen.



9 Press △+ or ▽- to set the channel that you want the TV to tune in.

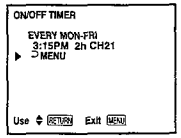
Each time you press △+ or ▽-, the channel number changes in sequence.





Press RETURN.

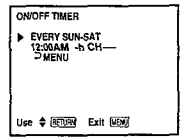
The setting is completed.



Cancelling the ON/OFF TIMER

1 Select the ON/OFF TIMER screen (Refer to pp. 30 - 32).
Press RETURN.
"EVERY SUN-SAT" will appear in red.

2 Press BACK SPACE to erase the ON/OFF TIMER.



To Change or Correct Setting the ON/OFF TIMER

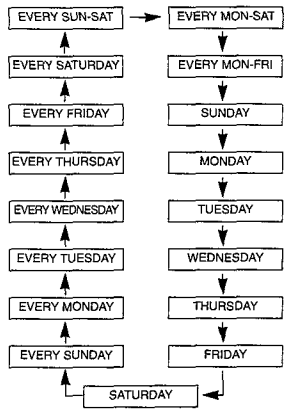
Before completing it
Press BACK SPACE to return to the item to be changed or corrected.
When it is displayed in red, set it again by using the △+ or ▽-

After completing it
Select the ON/OFF TIMER screen.
Then, press RETURN to return to the item to be changed or corrected.
When it is displayed in red, set it again by using the △+ or ▽-

Notes

- One minute before the timer goes off, the "TV will turn off" will appear on the screen.
- If you have not set the clock correctly, the ON/OFF TIMER will not operate at the proper time. To set the clock, see "Setting the Clock-AUTO CLOCK SET/MANUAL CLOCK SET," pp 25-29.
- All the settings including ON/OFF TIMER will be erased if you unplug the VIDEO TV or a power failure occurs. Reset the TIMER by following steps 1-9.

Fig. 1
Selecting the day(s) of the week
When you press △+, the days of the week appear in the following order.

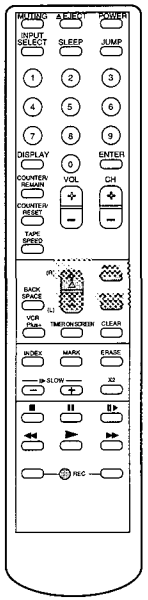


(▽ -: reverse order)

Note

To return to the normal screen
Press MENU.

USING THE TIMER-ACTIVATED FUNCTIONS



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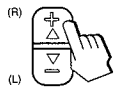
Setting the CHANNEL BLOCK

This feature allows you to prevent children from watching unsuitable programs. Make sure the clock is set correctly. If it is not, set the clock first (pp. 25 - 29).

1 In main menu, press △+ or ▽- to select SET UP

Then press RETURN.
The SET UP screen appears.

2 Press △+ or ▽- to select TIMER.
Press RETURN.
The TIMER screen appears.

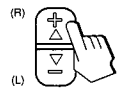



```
TIMER
   CURRENT TIME
   ON/OFF TIMER
▶  CHANNEL BLOCK
   ⊃MENU

Use ▲▼ RETURN  Exit MENU
```

3 Press △+ or ▽- to select CHANNEL BLOCK.
Then press RETURN.
The CHANNEL BLOCK screen appears.

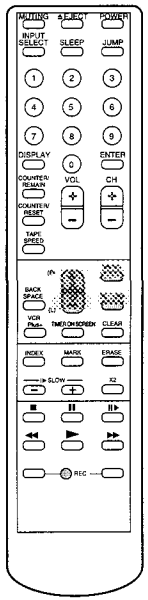
"Select a program" appears on the screen.




```
CHANNEL BLOCK
▶ 1EVERY SUN-SAT
  12:00AM -h CH---
  2EVERY SUN-SAT
  12:00AM -h CH---
  ⊃MENU
Select a program
Use ▲▼ RETURN  Exit MENU
```

4 Press RETURN again.
"Set the day" appears on the screen.

```
CHANNEL BLOCK
  1EVERY SUN-SAT
  12:00AM -h CH---
  2EVERY SUN-SAT
  12:00AM -h CH---
  ⊃MENU
Set the day
Use ▲▼ RETURN  Exit MENU
```

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5 Press △+ or ▽- to set the day.
Each time you press △+ or ▽-, the days of the week change as shown in Fig. 1 (page 32).

Then press RETURN.
"Set the time" appears on the screen.

```
CHANNEL BLOCK
  1EVERY MON-FRI
  12:00AM -h CH---
  2EVERY SUN-SAT
  12:00AM -h CH---
  ⊃MENU
Set the time
Use ▲▼ RETURN  Exit MENU
```

6 Press △+ or ▽- to set the hour that you want to start blocking time.
Each time you press △+ or ▽-, the hour changes in sequence.

Then press RETURN.

```
CHANNEL BLOCK
  1EVERY MON-FRI
  3:00PM -h CH---
  2EVERY SUN-SAT
  12:00PM -h CH---
  ⊃MENU
Set the time
Use ▲▼ RETURN  Exit MENU
```

7 Press △+ or ▽- to set the minutes.
Each time you press △+ or ▽-, the minutes change in sequence.

Then press RETURN.
"Set the duration" appears on the screen.

```
CHANNEL BLOCK
  1EVERY MON-FRI
  3:15PM 1h CH---
  2EVERY SUN-SAT
  12:00AM -h CH---
  ⊃MENU
Set the duration
Use ▲▼ RETURN  Exit MENU
```

8 Press △+ or ▽- to set the duration of time.
Each time you press △+ or ▽-, the duration changes from "1" to "12" in sequence.

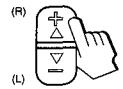
Then press RETURN.
"Select the channel" appears on the screen.

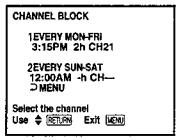
```
CHANNEL BLOCK
  1EVERY MON-FRI
  3:15PM 2h CH---
  2EVERY SUN-SAT
  12:00AM -h CH---
  ⊃MENU
Select the channel
Use ▲▼ RETURN  Exit MENU
```

USING THE TIMER-ACTIVATED FUNCTIONS

9 Press △+ or ▽- to set the channel that you want the TV to block out.

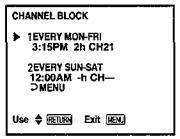
Each time you press △+ or ▽-, the channel number changes in sequence.





Press RETURN.

The setting is completed.



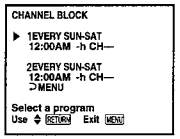
10 To set another program, repeat steps 1 to 3, press △+ or ▽- to select the next channel block and repeat steps 4 to 9.

Cancelling the CHANNEL BLOCK

1 Select the CHANNEL BLOCK screen. (Refer to page 33.)
Press RETURN.

EVERY SUN-SAT will appear in red.

2 Press BACK SPACE to erase the CHANNEL BLOCK.



To Change or Correct Setting the CHANNEL BLOCK

Before completing it
Press BACK SPACE to return to the item to be changed or corrected.
When it is displayed in red, set it again by using the △+ or ▽-

After completing it
Select the CHANNEL BLOCK screen.
Then, press RETURN to return to the item to be changed or corrected.
When it is displayed in red, set it again by using the △+ or ▽-

Notes

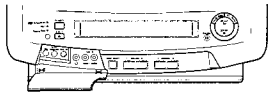
- If you have not set the clock correctly, the CHANNEL BLOCK will not operate at the proper time. To set the clock, see "Setting the Clock-Auto Clock Set/Manual Clock Set," pp 25-29.
- All the settings including CHANNEL BLOCK will be erased if you unplug the VIDEO TV or a power failure occurs. Reset the TIMER by following steps 1-9.
- If you select the blocked channel during the time you set, the message BLOCKED appears and the picture is blocked and the sound is muted.
- Recording is possible while the channel block is being activated.
- If the CHANNEL BLOCK and ON/OFF TIMER settings are overlapped, only the CHANNEL BLOCK function operates.

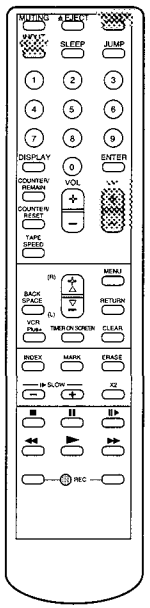
Note

To return to the normal screen
Press MENU.

1-13. USING THE PLAY ON FUNCTIONS

You can use PLAY ON on your VIDEO TV to monitor quickly other Video/Audio sources (such as a camcorder, a video game, etc).





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1 Connect an AV cable(Video camera,Game machine, etc) to LINE IN jacks on the front door or rear panel of your VIDEO TV.

2 Press the PLAY ON(Green Color button) inside the front door.
"LINE" appears on the screen.

Although your VIDEO TV is in TV mode or VCR play back mode, it turns to LINE IN mode directly by pressing PLAY ON.

When you press PLAY ON during the TV or VCR playback mode
Your VIDEO TV turns to LINE in mode.

To return to TV mode during play on mode
Press INPUT SELECT or CH +/-

When you press PLAY ON twice during power on
VIDEO TV turns off.

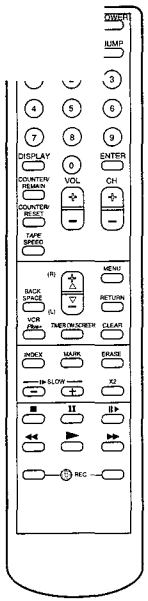
When you press PLAY ON during power off
Your VIDEO TV turns on and turns to LINE IN mode directly.
When you press this button again, your VIDEO TV will be turned off.

When you press PLAY ON during recording or LINE in mode,
The PLAY ON button does not operate.

Notes

- When the LINE IN jacks inside the front door and on the rear panel are connected to external equipment at the same time, the LINE IN jacks inside the front door are prior to them on the rear panel.
- If you press INPUT SELECT or CH+/- while your VIDEO TV is in play on mode by pressing PLAY ON, the VIDEO TV will be not turned off by pressing this button again. To turn it off, press POWER.

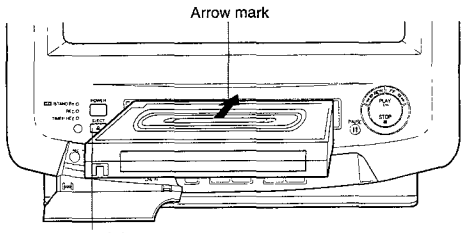
1-14. PLAYING BACK A VIDEO TAPE



RM-Y138/W

Inserting a Video Cassette

1 Insert a video cassette with the arrow mark facing upwards.



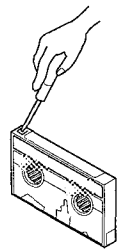
2 Gently press the center of the front side of the cassette until the mechanism draws it into the compartment.
When the cassette has been inserted, the ⊙ / STAND BY indicator lights and the VIDEO TV turns on automatically.

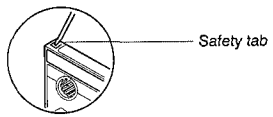
Note

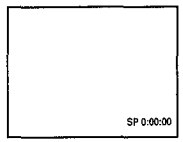
When you insert a cassette without a safety tab, playback starts automatically (AUTO *PLAYBACK function*).

Ejecting the cassette
Press EJECT ▲.
You can also eject the cassette when the power is off.

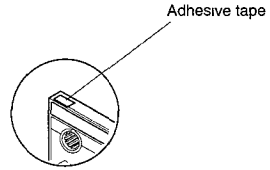
Protecting your cassette against accidental erasure
The cassette is provided with a safety tab to protect against accidental recording.
Break off the safety tab with a screwdriver or other suitable tool.
If the safety tab is removed, the cassette will be ejected when you try to record on the cassette.







To record on a cassette with the safety tab broken off, simply cover the tab hole with adhesive tape.



Maximum recording time of a tape

The quality of tape you use greatly affects record/playback quality and the life of the *VIDEO TV. Use only cassette tapes that have the official* VHS logo.
High-grade tapes give the best results, especially at the EP speed. They also have a better oxide coating that helps prevent dirty video heads. Although T-160 tapes offer the longest recording time, they contain thinner tape that is more likely to stretch or cause tape jams. We suggest that you use T-120 or shorter tapes.

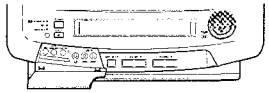
Recording in the SP or EP mode is possible with this unit. When recording, select the desired recording mode (SP or EP) with TAPE SPEED on the Commander. During playback, the unit automatically detects the recording format, and then plays back the tape in the appropriate mode.

The following chart shows the maximum recording times for T-60, T-120 and T-160 tapes at the recording speeds as below.

Speed	T-60	T-120	T-160
SP	1 Hour (60 Minutes)	2 Hours (120 Minutes)	2 2/3 Hours (160 Minutes)
EP	3 Hours (180 Minutes)	6 Hours (360 Minutes)	8 Hours (480 Minutes)

Playing back a video tape in the LP mode is possible but recording in this mode is not possible with this unit.

PLAYING BACK A VIDEO TAPE



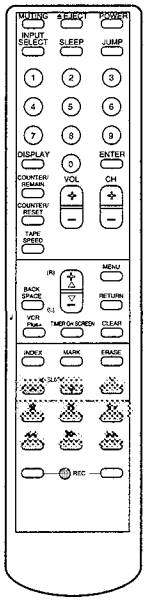
Playing Back a Prerecorded Cassette Tape

1 Insert a prerecorded cassette into the tape compartment. The VIDEO TV automatically turns on.

Note

When playing back rental tapes, select NOISE REDUCTION:ON in main menu image detail improves.

2 If playback does not start, press PLAY ▶ The tape plays back at the speed at which was recorded.



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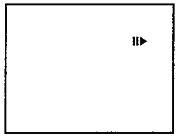
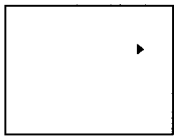
To stop playback
Press STOP ■.

To stop playback for a moment
Press PAUSE ❚❚.
I▶ appears on the screen and image will stop on the screen.
To resume playback, press PAUSE ❚❚ or PLAY ▶
▶ appears on the screen.

When the tape is played back to the end
The tape is automatically rewound to the beginning (auto rewind). The power remains on.





To rewind the tape to its beginning and to playback automatically (Auto Playback Function)
In the main menu, press △+ or ▽- to select SET UP during playback or stop mode and then press RETURN. And press △+ or ▽- to select AUTO REPEAT and then press RETURN. By using △+ or ▽-, select AUTO REPEAT to ON.

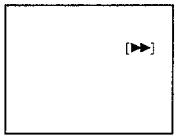
Variable Speed Playback

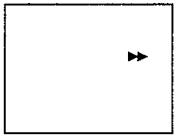
You can enjoy playing back pictures in variable speeds on the VCR.

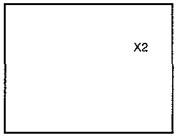
Still Picture
During playback mode, press PAUSE ❚❚ To resume normal playback, press PLAY ▶ or PAUSE ❚❚.

Notes

- No sound accompanies the picture, which may be unstable or have video "noise" in it. This is normal.
- If the VCR is left in the pause mode for more than about 5 minutes, the VIDEO TV will be in playback mode automatically.







To see a slow motion (Slow Picture)

Press -SLOW+ during playing back.

To advance the picture frame by frame (Frame Picture)

Press FRAME I▶ during Still Picture.

To advance the tape rapidly

While the tape is being played back, pressing FAST FORWARD ▶▶ will move the tape forward at high speed so you can see the picture and choose where to stop.
When you do this, [▶▶]appears on the screen.

If you release the button, the VCR will return to normal playback.

When tape is not being played back and the VCR is in the stop mode, pressing FAST FORWARD ▶▶ winds the tape forward at very high speed without displaying the picture.
When you do this, ▶▶ appears on the screen.

You can stop the forward running of the tape at any time by pressing STOP ■.

If during the operation, the tape rewinds forward to the end, the machine will automatically stop and then rewind the tape back to the beginning again.

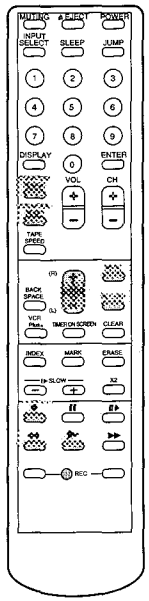
By pressing X2, you can now run through a tape at twice normal speed to find the exact place you want. Revert to normal speed by pressing PLAY ▶

To rewind the tape rapidly
If you press REWIND/REVIEW ◀◀ while the tape is being played back, you can play the tape backwards to find a particular spot. When you do this, [◀◀]appears on the screen and the tape will be rewound at very high speed.
At the end, STOP appears on the screen and invite you to press PLAY ▶

Viewing TV Programs During Tape Playback

While a tape is being played, you can switch to watching TV broadcasts.
Press STOP ■.
The VIDEO TV returns to normal TV reception mode.

PLAYING BACK A VIDEO TAPE



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Playing Back a Tape Recorded on Another VCR

When playing back a tape recorded on another VCR, there might be some picture noise.

Tracking ensures that the tape is correctly aligned with the playback head. It only works in the "playback" mode and its principle purpose is to minimize picture shake and what is called "noise" (fuzzy lines across the picture during playback and still picture).

It is adjusted either automatically or manually.

Automatic tracking adjustment function
When playback starts, the auto tracking automatically adjusts the picture. "AUTO TRACKING" flashes for 5 seconds.

The automatic tracking control is activated in the following conditions:
- When the cassette is inserted for the first time.
- When the recording mode on the playback tape is switched from SP to EP and back again.
- When the picture is distorted by scratches on the tape.
- When TRACKING AUTO:ON is selected in the Tracking menu after the picture is adjusted automatically.

If auto tracking does not work, the tracking was probably last adjusted manually.

Adjusting the tracking manually during playback
When the playback picture proves to have streaks or snow during normal playback, Still picture or Slow picture, adjust the picture manually using the Tracking menu. Press either △+ or ▽- to select TRACKING ADJUST in Tracking menu to obtain the best possible picture. Press RETURN and adjust by pressing △+ or ▽- When playing back a tape recorded on another VCR, the tracking condition is automatically adjusted on this VCR.

Notes

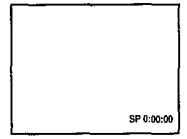
- Auto tracking adjustment may be impossible when the recording condition of the tape is poor.
- During auto tracking adjustment, streaks or noise may appear.

Note

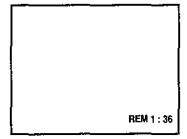
For seeing the remaining tape time, first check the tape mode.
If you want to see the remaining tape time in T-120, press RETURN then △+ or ▽- until T-120 appears in TAPE REMAIN screen. For OTHERS, press the button until OTHERS appears.

Using COUNTER/REMAIN

To display the counter, press COUNTER /REMAIN once.
The tape counter shows the tape travel time in hours, minutes and seconds during recording or playback.



To see the remaining tape time during recording or playback, press COUNTER/REMAIN twice.
The remaining tape time appears with "REM."

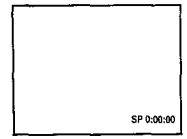


Using Counter Memory Function

The counter memory makes it easy to return to a particular spot on the tape after recording or playback. The tape stops when the counter reaches SP 0:00:00. This feature is especially helpful when editing a recording.

1 Press COUNTER/REMAIN to see the counter.

2 Start recording or playback, and press COUNTER RESET at the point you want to return to.
The counter displays SP 0:00:00.

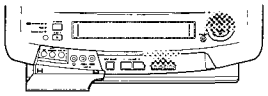


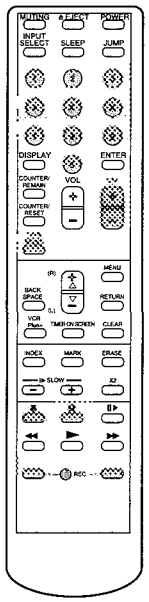
3 Press STOP ■ when you finish recording or playing the tape.

4 Press REWIND/REVIEW ◀◀.
The tape stops at SP 0:00:00.

5 Press PLAY ▶ to play the tape.

1-15. RECORDING TV PROGRAMS





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Recording TV Programs

Caution
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission and/or program owner.

1 Insert a cassette with the safety tab.
The VIDEO TV turns on automatically (Auto power on).

2 Select the recording tape speed, SP or EP, with TAPE SPEED.

3 Select the channel to be recorded with CHANNEL +/- or 0-9 buttons.

4 Press the two REC buttons on the Commander at the same time, or the REC button on the unit.
The REC indicator lights.

To stop recording
Press STOP ■.

Temporarily to stop recording at a particular point
Press PAUSE ❚❚ to eliminate unwanted station breaks or program material while recording a TV program.
REC ❚❚ appears on the screen.
To resume recording, press PAUSE ❚❚ again.
When the recording pause mode lasts for more than approximately 5 minutes, the unit enters the stop mode.

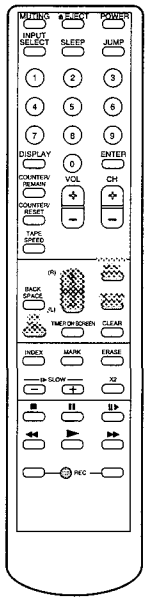
Note

When the tape reaches its end
The tape rewinds to the beginning. The power will remain on.

Recording a Program Without Watching the TV

Turn off the power of the TV.
There will be no interference with the recording.
You cannot watch another program while recording one program.

RECORDING TV PROGRAMS USING VCR PLUS +



RM-Y138/W

VCR Plus+ is a feature in SONY VCRs that simplifies the task of programming the VIDEO TV to make timer recordings.

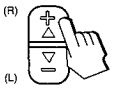
How VCR Plus+ works
Whenever you want to record a TV program, all you need to do is look up the program's "PlusCode," a number assigned to each program that's published in the TV section of most newspapers, cable TV listings, and even TV GUIDE magagine. Then, just enter the PlusCode of the program you want and the VIDEO TV is automatically programmed to record that show. It's that simple. With VCR Plus+ , you no longer have to go through a lengthy and often repetitive procedure when you set start and stop times, channel numbers, and dates. All this information is automatically sent to your VIDEO TV when you enter the program's PlusCode.

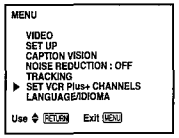
Setting Up VCR Plus +

Setting up your VIDEO TV involves coordinating the TV channel number(the number you turn to on your set to watch a program) with the guide channel number (the number that's assigned to that channel in your program guide). To get the guide channel numbers, find the "Channel Line-up Chart" in the program guide for your area that features VCR PlusCodes. It usually looks like the example on page 45.

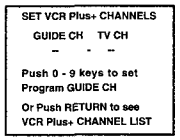
For each channel your VIDEO TV receives, use the Channel Line-up Chart to check that the channel numbers match. For example, if HBO is listed in the Channel Line-up Chart on channel 33, and your VIDEO TV receives HBO on channel 15, you need to coordinate these numbers using the following procedure. For channels in which the numbers are the same (for example, if your VIDEO TV recevies HBO on channel 33, and the guide channel number is 33), you can skip this procedure.

1 In main menu, press △+ or ▽- to select SET VCR Plus+ CHANNELS.



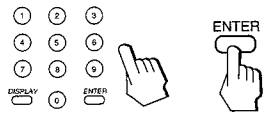


2 Press RETURN
The SET VCR Plus+ Channels screen appears and the GUIDE CH is highlighted.



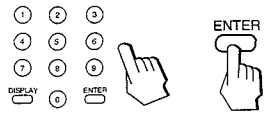
SETTING UP VCR PLUS +

3 Press 0-9 to enter the channel number assigned in the program guide and press ENTER.
The TV CH is highlighted.



SET VCR Plus+ CHANNELS
GUIDE CH TV CH
25 - 25
Push 0 - 9 keys to set your TV CH
Then push ENTER

4 Press 0-9 to enter the actual number on your VIDEO TV channel.



SET VCR Plus+ CHANNELS
GUIDE CH TV CH
25 - 25
Push 0 - 9 keys to set program GUIDE CH
Or Push RETURN to see VCR Plus+ CHANNEL LIST

SET VCR Plus+ CHANNELS
GUIDE CH TV CH
25 - 10
Push 0 - 9 keys to set your TV CH
Or Push RETURN to see VCR Plus+ CHANNEL LIST

5 *Repeat steps 3-4 for each channel whose numbers don't match.*

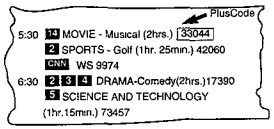
6 When you have set all channels, press RETURN to confirm your channel settings.

VCR Plus+ CHANNEL LIST
Page 1

GUIDE TV	GUIDE TV
3 - 15	33 - 18
5 - 22	59 - 3
6 - 17	61 - 47
17 - 55	77 - 35
28 - 9	90 - 8

Use ▲▼ to change page
Push MENU to Exit

Example of "PlusCode"


PlusCode
5:30 1H MOVIE - Musical (2hrs.) 33044
2 SPORTS - Golf (1hr. 25mn.) 42060
CNN WS 9974
6:30 2 3 4 DRAMA-Comedy(2hrs.)17390
5 SCIENCE AND TECHNOLOGY
(1hr.15mn.) 73457

Example of "Channel Line-up Chart"

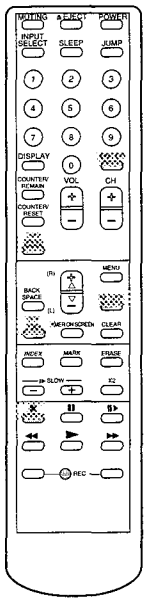
CABLE CH	CABLE TV	VCR Plus+ GUIDE CH
16	AMC American Movie Classics	35
17	BRV Bravo (program grid only)	54
20	CNN Cable News Network	42
21	CSP C-SPAN	28
22	DIS The Disney Channel	56
25	DSC The Discovery Channel	57
34	ESN ESPN	34
35	FAM The Family Channel	47
5	HBO Home Box Office	33
27	LIF Lifetime	46
29	MAX Cinemax	45
30	MTV Music Television	48
31	NIK Nickelodeon	38
38	SC Sports Channel	59
39	SCA Sports Channel America	70
45	SHO Showtime	41
17	TBS TBS SuperStation	43
44	TMC The Movie Channel	58
49	TNN The Nashville Network	49
50	TNT Turner Network Television	52
51	USA USA Network	44

SAMPLE

Note

- To return to the normal screen. Press MENU.

RECORDING TV PROGRAMS USING VCR PLUS +



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Before you start

- Check that the clock is set correctly.
- Insert a tape with its safetly tab in place. Make sure the tape is longer than the total recording time.
- Turn on your VIDEO TV. When using a cable box, turn it on.

Notes

- *You cannot set VCR Plus+ in the following cases:*
  When the VIDEO TV is turned off.
- The timer will not accept setting in the following cases:
  When you select Daily for a Saturday and Sunday program.
  When you select Daily or Weekly for a program more than seven days ahead.
  When you enter the PlusCode of a program that has already ended.
- *If the 6 programs have already been preset,* "6 PROGRAMS HAVE ALREADY BEEN SET" appears on the screen.

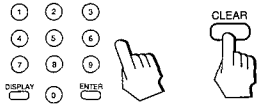
Recording TV Programs

You can preset up to six programs within a one month time frame.

1 Press VCR Plus+

VCR Plus+ 1/6 SAT
PlusCode [————] TAPE SPEED [AT]
Enter Program's PlusCode using 0-9 keys
To change tape speed push TAPE SPEED

2 Press 0-9 to enter the Plus Code of the program you want to preset.
If you've made a mistake, press CLEAR and enter the PlusCode again.



VCR Plus+ 1/6 SAT
PlusCode [26854—] TAPE SPEED [AT]
After entering PlusCode, pus] RETURN
If you make a mistake, push CLEAR

3 Press TAPE SPEED to select the tape speed, SP, EP or AT.

VCR Plus+ 1/6 SAT
PlusCode [26854—] TAPE SPEED [SP]
Enter Program's PlusCode using 0-9 keys
To change tape speed push TAPE SPEED

4 Press RETURN.
The recording information appears on the screen. Check that the information is correct. If it is not, press CLEAR to cancel.
To preset another timer setting, repeat steps 1 to 4.

Notes

- When you press TIMER ON SCREEN after having checked the recording information, the TIMER SET/ CHECK menu appears with the recording information of program presetting *using VCR Plus+.*
- **Once, Daily or Weekly Setting**
  Press RETURN to return curser to the item presetting in TIMER SET/CHECK menu (Then refer to the step 3 on page 48 and Daily/Weekly Recording on page 49.).

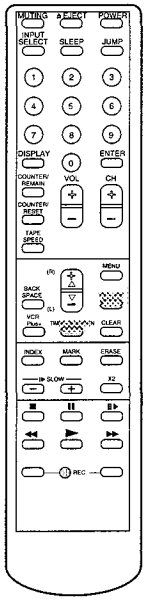
VCR Plus+ 1/6 SAT
PlusCode [26854] TAPE SPEED [EP]
RECORDING TIME
DATE START STOP CH
1/25THU 4:30PM 6:00PM 03EP
To set timer, push POWER
To cancel, Push CLEAR

5 Press POWER to turn off the VIDEO TV.
The TIMER REC indicator lights up and the VIDEO TV stands by for recording.
When using a cable box, leave it on. The VIDEO TV automatically turns on, records the program and turns off.

To stop recording while recording - Press STOP ■

To use the VIDEO TV before recording begins
Press POWER to turn on the VIDEO TV. The TIMER REC indicator goes off and the VIDEO TV is ready for use. After using the VIDEO TV, turn it off again to turn on the TIMER REC indicator. When using a cable box , leave it on. Remember to reset the VIDEO TV to stand by for recording before the time you've set the VIDEO TV to start recording, or the timer setting will be cancelled.

TIMER RECORDING



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You can preset up to six recordings up to one month in advance. The recordings can be preset with the Commander while referring to the TIMER SET/CHECK display on the screen.

Before you begin, check the following points.

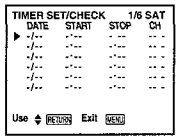
- The date and clock must be set correctly. (See "Setting the Clock - AUTO/MANUAL CLOCK SET" on pp. 25-29.)
- Make sure that the cassette tape is long enough to record all the programs.
- Make sure that the safety tab on the cassette is not broken off.

Recording from today to one month later
If today is August 31st, you can set the timer to record a program broadcast between today and September 30 (for 31 days). If today is January 31st, you can set the timer to record a program broadcast between today and February 28th (for 29days). A leap year is automatically considered.

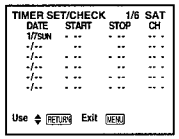
Setting the Timer

Example: Suppose you want to record a program broadcast on channel 26 from 9:00 PM on Wednesday January 10 in EP mode. Note that 12:00 AM is midnight and 12:00 PM is noon.

1 Press TIMER ON SCREEN.
The TIMER SET/CHECK screen appears.

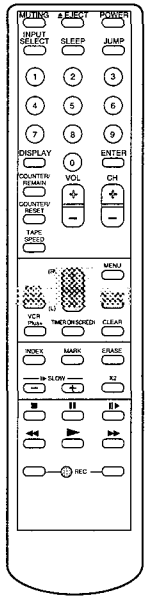


2 Press RETURN.
Make sure that today's date changes in red.
If not, reset the correct time. See "Setting the Clock - AUTO/MANUAL CLOCK SET" on pp. 25-29.



Note

During timer recording, ⏺ / STAND BY indicator lights.



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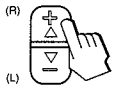
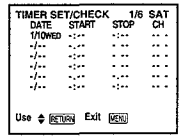
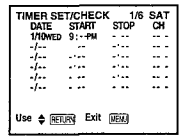
3 Press △+ or ▽- to set the month and date to 1/10 WED.
The day of the week is automatically set.

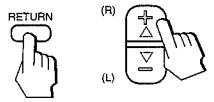


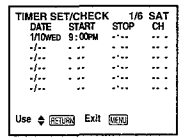


4 Press RETURN to change the hours section under "START" in red then △+ or ▽- until 9 PM appears.

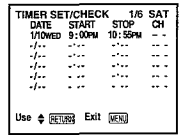


5 Press RETURN to change the minute section under "START" in red then △+ or ▽-until 00 appears.

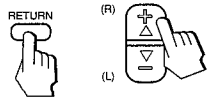


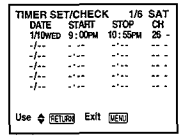


6 Press RETURN.
The hours section under "STOP" changes in red. Set the turn-off time referring to steps 4 and 5.



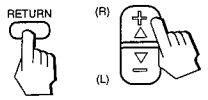
7 Press RETURN to change the CH position in red then △+ or ▽-until 26 appears.

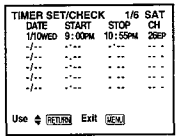




TIMER RECORDING

8 Press RETURN to change the recording speed position in red then △+ or ▽- until EP appears.

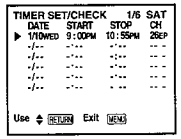




Note

The AT (AUTO SPEED) mode starts recording at the SP speed, but if it determines there isn't enough tape left to complete the programmed recording, it switches to the EP speed.

9 Press RETURN to store the setting.



10 After you finish programming, press POWER to turn off the VIDEO TV.
The TIMER REC indicator lights.

To change or correct the setting before completing it
Press BACK SPACE to return to the item to be changed.

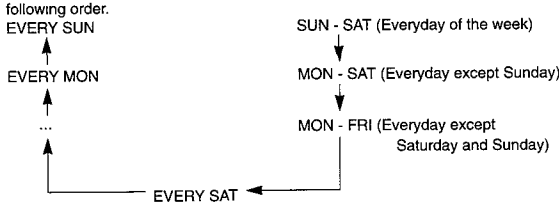
To preset another program
Move the cursor to the second line after step 9 and repeat steps 2 to 10.

Daily/Weekly Recording
You can preset the timer-activated recording to the same program everyday of the week (Daily recording), or one day of the week(Weekly recording).

Follow steps 1 through 2 in "Setting the Timer" on page 47.

You can select the following programs.

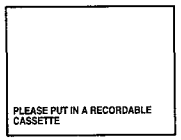
Each time you press ▽-, the indication under "DATE" on screen changes in the following order.


EVERY SUN
SUN - SAT (Everyday of the week)
EVERY MON
MON - SAT (Everyday except Sunday)
...
MON - FRI (Everyday except Saturday and Sunday)
EVERY SAT

Notes

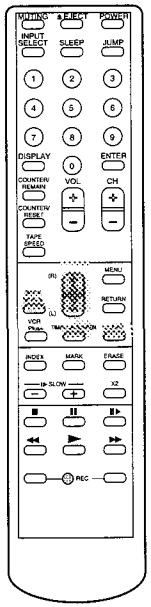
The following messages under each case appear on the screen:

- "PLEASE PUT IN A RECORDABLE CASSETTE" ---



When switched to stand-by mode for timer recording, if a cassette is not inserted or a cassette without safety tab is inserted.

- "PLEASE PUSH POWER OFF TO SET TIMER"---
  When the VIDEO TV is still turned on before the timer recording starts or when SLEEP OFF time and TIMER REC START overlap.
- "PLEASE STOP THE TAPE"---
  When TIMER ON SCREEN is pressed at the same time the tape is being played back.
- "VCR IS RECORDING"---
  When PLAY, FAST FORWARD, REWIND /REVIEW, EJECT, CH +/-, 0~9 buttons, INPUT SELECT, JUMP or MENU is pressed at the same time the timer recording is being done.
- "TIMER REC STARTS IN 5 MINUTES"---
  5 minutes before timer recording starts.
- "PLEASE SET THE CLOCK FIRST"---
  When TIMER ON SCREEN is pressed in the condition the current time is not set.
- "VCR is TIMER RECORDING"---
  When STOP button is pressed during recording.
  The recording is not stopped.
- To stop the Timer Recording
  1. Press TIMER ON SCREEN
     TIMER SET/CHECK screen appears.
  2. Press △+ or ▽- to select TIMER REC PROGRAM.
  3. Press CLEAR
     The program is cleared and the timer recording stops.



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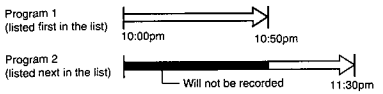
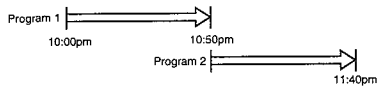
When Preset Timer Recordings Overlap

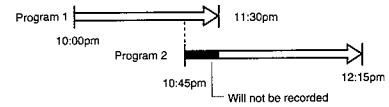
If the turn-on time of two programs are the same
The program listed first on the TIMER SET/CHECK display has priority over the other programs. The timer recording of lower priority programs will be done from the point after program 1 is finished.



If the recording start time of program 2 is the same as the recording end time of program 1



If the recording start time of program 2 comes before recording of program 1 is over
The recording of program 2 will begin after program 1 is finished.



Note

If a power interruption occurs
- If a power interruption lasting less than approximately three hours occurs while the VCR is waiting for the preset time, the VIDEO TV re-enter the timer recording standby mode.
- If a power interruption lasting more than approximately three hours occurs before a timer recording, the memory clears. Reset the date and time for timer recording.
- If a power interruption lasting less than approximately three hours occurs during a timer recording, the VIDEO TV starts recording again.

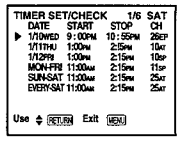
If the recording start time of the program is same as the time set with ON/OFF TIMER (pp.30-32)
- The ON/OFF TIMER has priority over the timer recording so that the timer recording will not start. In this case, set the recording start time earlier than ON/OFF TIMER and the timer recording will start.

TIMER RECORDING

Checking the Timer Settings

You can display all of the timer settings on the VIDEO TV screen to check the settings.

1 Press TIMER ON SCREEN.
The TIMER SET/CHECK screen appears.

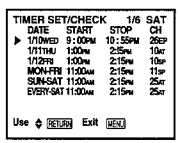


2 Press TIMER ON SCREEN again to return to the original screen.

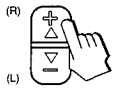
Changing or Cancelling the Timer Settings

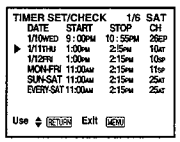
The timer settings can be changed or cancelled by referring to the TIMER SET/CHECK display.

1 Press TIMER ON SCREEN.
TIMER SET/CHECK screen appears.

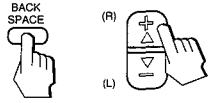


2 Press △+ or ▽- to move the cursor to the program you wish to change or cancel.





3 To change it, flash the item to be changed by pressing BACK SPACE and make the required changes by pressing △+ or ▽-



To cancel it, move the cursor to the item to be cancelled by pressing △+ or ▽- then press CLEAR.

4 Press TIMER ON SCREEN to return to the original screen.

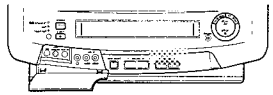
Notes

The TIMER SET/CHECK display

- When a recording is set for only one day, that setting is erased from the TIMER SET/CHECK display after the recording is over.
- The timer recording programs by using VCR Plus+ is also displayed in the TIMER SET/CHECK on-screen menu.

QUICK TIMER RECORDING

This function is convenient when, for example, you want to set the VCR to start recording immediately without going through the whole timer setting procedure.



Notes

- Make sure that the clock is set correctly before you activate Quick Timer Recording.
- During Quick Timer Recording, you cannot change the channel on the VIDEO TV.

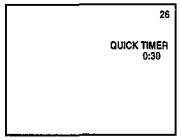
1 Insert a cassette. The VIDEO TV automatically turns on.

2 Press INPUT SELECT so that a channel number appears.
Press TAPE SPEED to select the recording speed, SP or EP

3 Select the desired channel number with the 0-9 buttons or CHANNEL +/-
If you try to select the Cable TV channel, first set CABLE to ON in SET UP menu.

4 Press QUICK TIMER REC on the front panel.

5 Each time you press QUICK TIMER REC, the time length advances in 30-minute increments up to 8 hours.



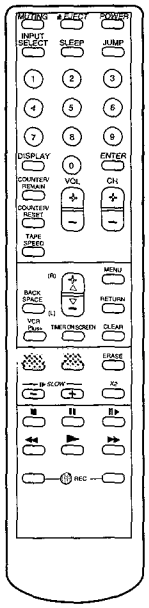
After you select the desired time length, Quick Timer Recording starts from that point.

Notes

- To extend the Quick Timer Recording time, press QUICK TIMER REC. to advance the recording time in 30-minute increments.
- To clear the Quick Timer Recording setting, press QUICK TIMER REC until time length is 0:00
- If the tape runs out during Quick Timer Recording, recording will stop and the power goes off. The tape will not rewind automatically.
- If a power interruption occurs during Quick Timer Recording, recording will stop and the power goes off. If the power interruption lasts less than three hours and the power is restored before the recording end time, recording will start again from that point.

1-16. INDEX FUNCTION

INDEX signal marks on the tape let you scan through the start of different programs or search for a specific section of tape.



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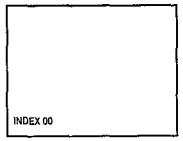
Marking INDEX Signals

Automatic INDEX mark
An INDEX signal is automatically marked at the beginning of recording.

Manual INDEX mark
INDEX signals can be marked at any desired point during any recording or normal playback.

Press INDEX once.
INDEX 00 appears.



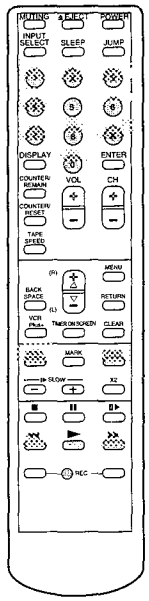
Then press MARK at the point where you want to mark INDEX signal. INDEX MARK appears on the screen.

Notes

- Leave an interval of more than 2 minutes between INDEX signals when marking them one after the other so that the VCR can detect them correctly.
- While an INDEX signal is being marked during playback, the recorded sound will not be heard, but it will not be erased.
- *You cannot mark an INDEX signal in the following cases:*
  - On a tape without safety tab.
  - On an unrecorded portion of a tape.
  - Immediately before a point on the tape *where the tape speed changes.*

Playing Back From the INDEX Point

The beginning of each program can be found and played back by using the INDEX signals.



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1 Insert a cassette with INDEX signals.

2 Press INDEX once during playback.
INDEX 00 appears on the screen.

3 Press either FAST FORWARD ▶▶ or REWIND/REVIEW ◀◀ to start the INDEX scan.The tape rewinds or rapidly advances to the next marked signal.

The tape plays back for about 5 seconds, then rewinds or rapidly advances to the next INDEX signal. Each time INDEX signal is detected and playback begins, the INDEX scan number (INDEX SCAN 04) appears.

4 When the desired program is detected, press PLAY ▶
Playback starts from that point.

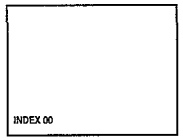
INDEX FUNCTION

Locating the Desired Program (INDEX Search)

A particular program can be located and played back by designating how many INDEX signals ahead or behind that program is from the current position.

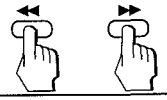
1 Insert a cassette with INDEX signals.

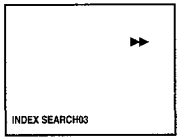
2 Press INDEX.
INDEX 00 appears.



3 Using the 0-9 buttons, enter the number of INDEX signals you want to skip.
For example, if the tape is at INDEX 02 and you want to locate INDEX 05, press 0 3.
You can select maximum location by INDEX 99.

4 Press either FAST FORWARD ▶▶ or REWIND /REVIEW◀◀
INDEX SEARCH03 appears on the screen. When the desired signal is found, playback begins automatically.



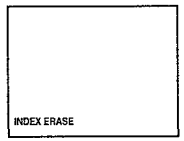


Erasing INDEX Signals

You can erase unnecessary INDEX signals.

1 Press INDEX during STOP mode.
INDEX 00 appears.

2 Press ERASE.
INDEX ERASE appears on the screen.



3 Press either FAST FORWARD▶▶ or REWIND/REVIEW ◀◀
The first subsequent INDEX signal is erased and the tape begins playback.

Note

While INDEX signal is being erased, the recorded sound is temporarily muted.

1-17. TROUBLESHOOTING

If you have a problem with the VIDEO TV, first check the power cord connection, then go through the following list. Should the difficulty persist, unplug the unit, and contact your Sony dealer or local authorised Sony service facility.

VIDEO TV RECEPTION

Symptoms	Suggestions
No picture or sound	• Make sure the unit is plugged into a working AC outlet. • Make sure it is not set to LINE IN mode. • Check that POWER is set to ON. • Check the antenna wires, connections and direction.
Picture OK, sound poor	• Adjust the sound.
Sound OK, no picture	• Try another channel. • Adjust the picture.
Picture weak or blurred	• Check the antenna wires, connections and direction. • Adjust picture control.
Picture rolls vertically	• Check the antenna wires, connections and direction.
Ghosts (multiple images)	• Check the antenna wires, connections and direction. • Install a directional antenna.
Wrong color or no color	• Adjust color and hue controls.
No response to button pressing	• Press the buttons carefully again. Unplug the set, then plug it in and try again.
No response to remote control	• Check the polarity (+and −) of the batteries. • Replace the batteries.

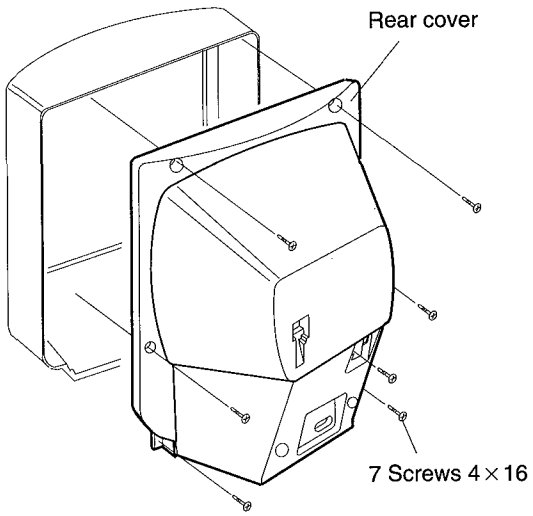
TROUBLESHOOTING

VCR OPERATION

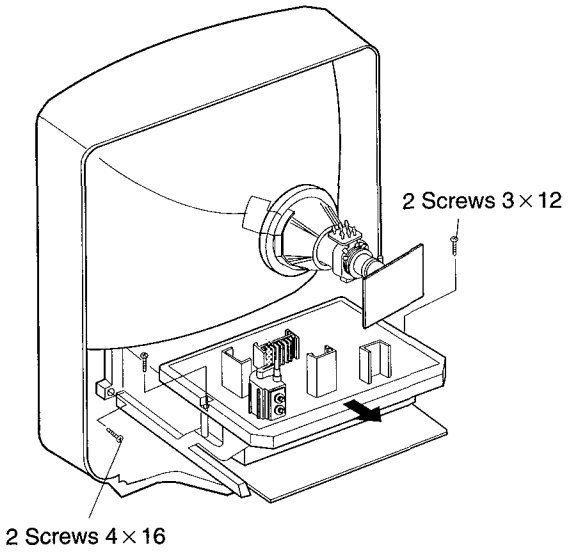
Symptoms	Suggestions
Cannot load video cassettes	• Insert the cassette with the window side up and the safety tab facing you. • Check if a video tape is already in the VCR.
No operation when buttons are pressed	• Cancel the Quick Timer Recording.
Auto play function doesn't work or TV programs can't be recorded	• Make sure that the receiving channel of the set is properly tuned. • Make sure that the safety tab on the video cassette tape is still intact. • Check antenna wires, connections and direction.
Timer recording can't be performed	• Make sure the recording start/stop time is correct. • Reconnect the power plug to an AC outlet, and reset the program recordings.
There is no picture in playback, or the playback picture is noisy or contains streaks	• Check that power is set to ON. • Check that the video cassette tape has a recorded program. • Check the tracking control (for noise streaks)
Video cassette tape was inserted incorrectly	• Wait a few seconds. The video cassette tape should eject itself.

SECTION 2
DISASSEMBLY

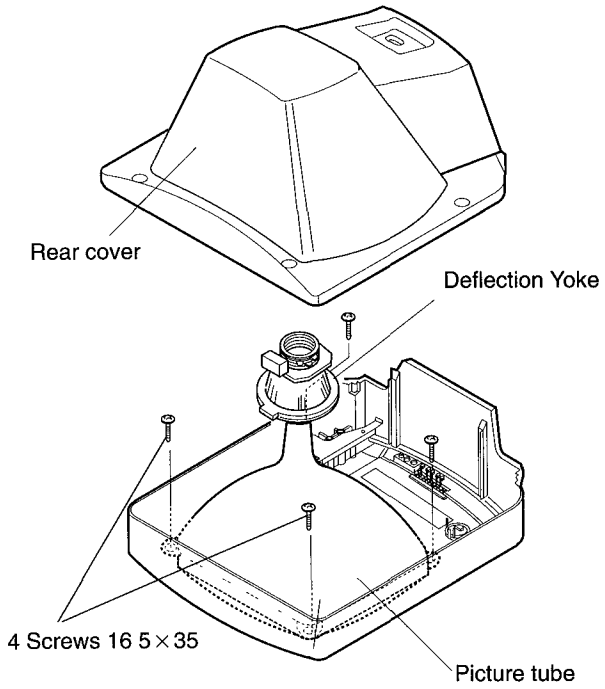
2-1. REAR COVER REMOVAL



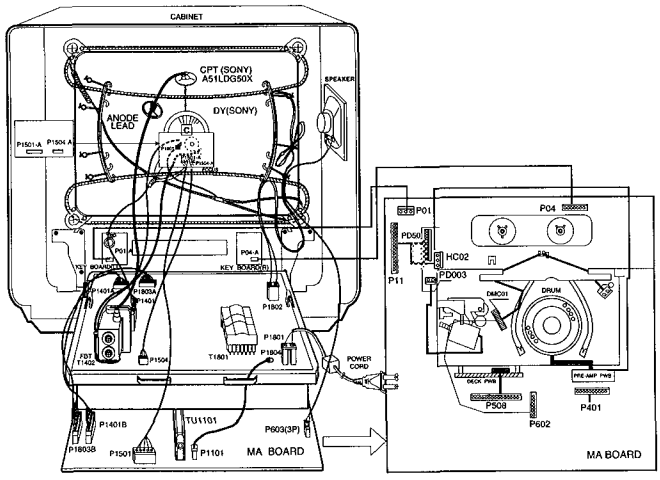
2-2.CHASSIS ASSY REMOVAL



2-3. PICTURE TUBE REMOVAL

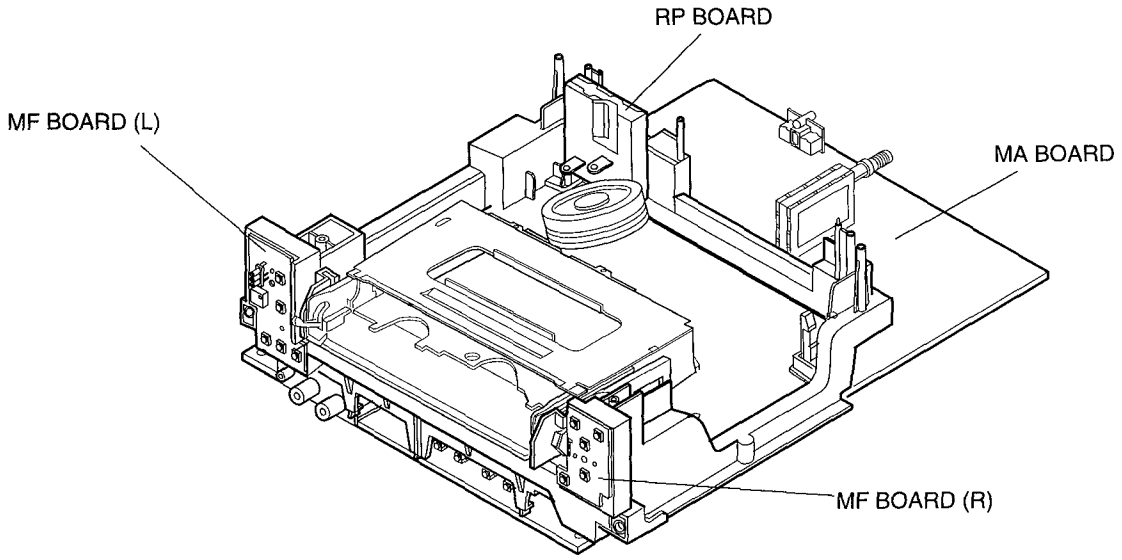


2-4. WIRE DRESSING

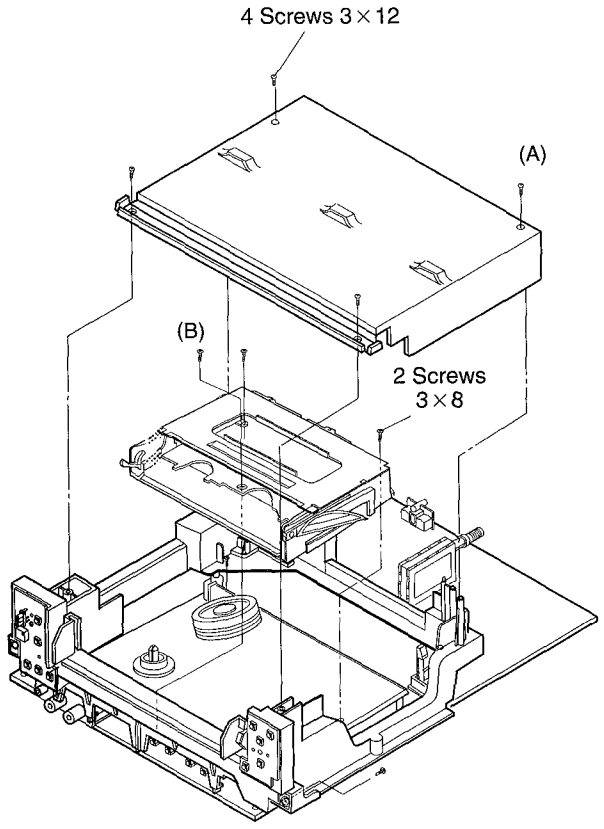


2-5. CIRCUIT BOARDS ARRANGEMENT

Remove the top case from deck assy and main frame.

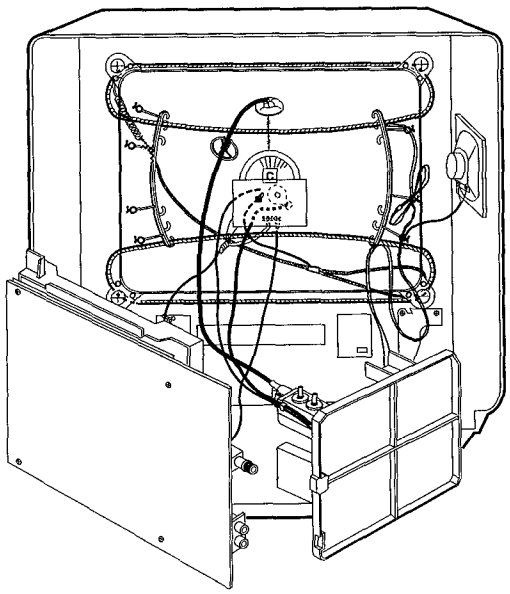


2-6. TOP CASE & HOUSING ASSY DISASSEMBLY



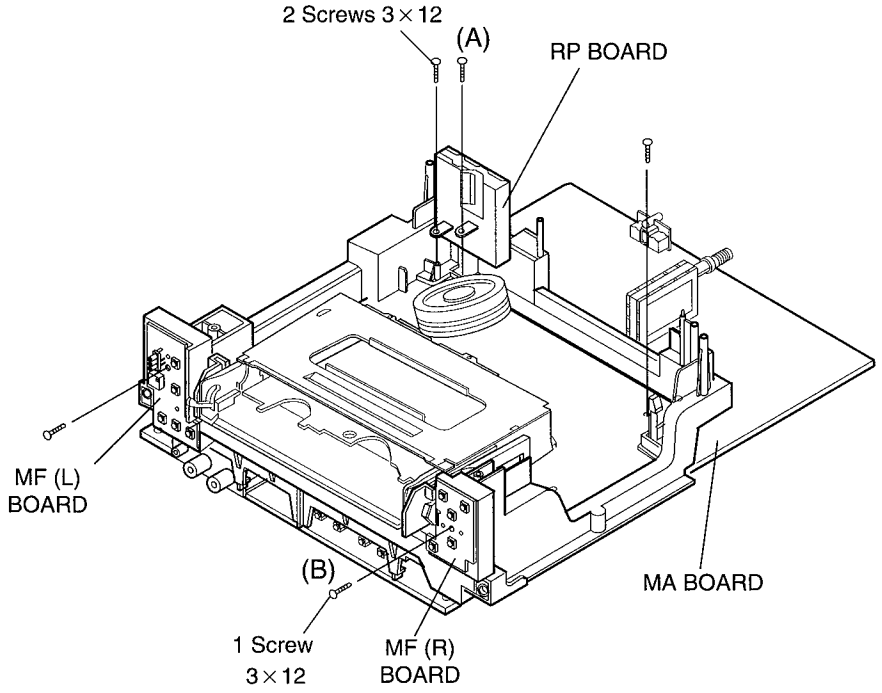
1) Remove the top case by removing 4 screws (A) on the main frame.
2) Remove two screws (B) and then separate the housing assy and main frame

2-7. SERVICE POSITION



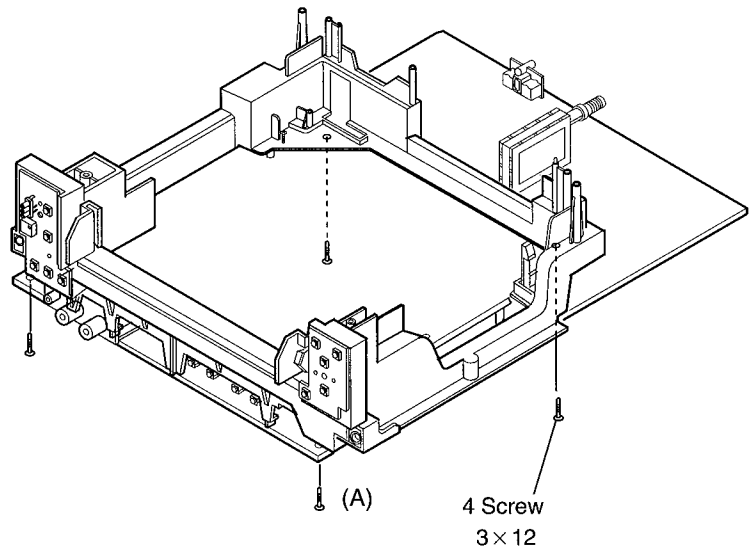
2-8. DECK & RP BOARD DISASSEMBLY

1) Remove two screws (A) for disassembling the shield case.
2) Remove screw (B) and then separate the main frame and MF (R) board.



2-9. MA BOARD DISASSEMBLY

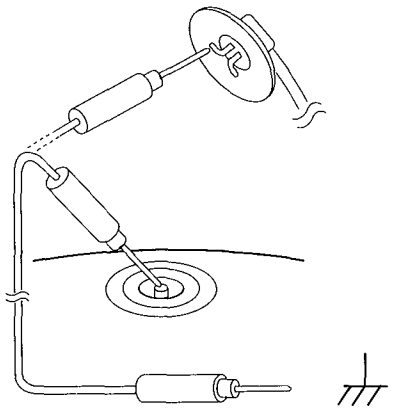
Remove 4 screws (A) and then separate the main frame and MA board



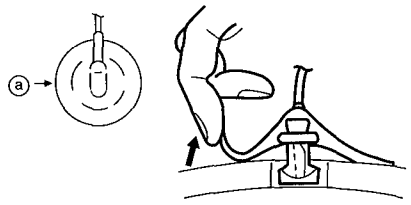
· REMOVAL OF ANODE-CAP

NOTE: Short circuit the anode of the picture tube and anode cap to the metal chassis, CRT shield or carbon painted on the CRT, after removing the anode.

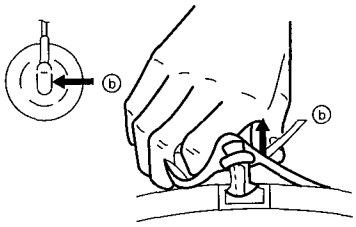
CAUTION: Anode-cap must be removed after discharge.



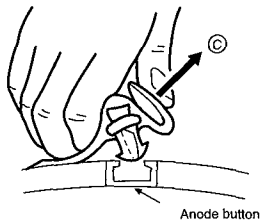
REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



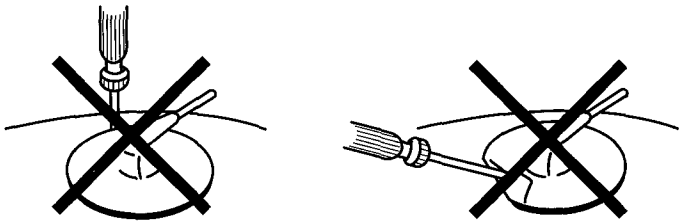
② Using a thumb, pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ.

HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with sharp objects.
② Don't press the rubber or you will hurt the inside of the anode-cap.
A material fitting called as shatter-hook terminal is built in the rubber.
③ Don't turn the foot of rubber over hardly! The shatter-hook terminal will stick out or hurt the rubber.



SECTION 3
SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete re-alignment is required or a new picture tube is installed
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switches should be set as follows unless otherwise noted.

Standard Picture condition.

PICTURE	80%
BRIGHT	50%
HUE	50%
COLOR	50%
SHARPNESS	50%

Preperation:
- Input a white signal.
- Before starting, degauss the entire screen

3-1. BEAM LANDING

1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown in Fig.2
3. Input a green raster.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are at the sides evenly. (Fig.3)
5. Move the deflection yoke forward, and adjust so that the entire screen becomes green. (Fig 1)
6. Switch the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. When landing at the corner is not right, adjust by using the disk magnets (Fig.4)

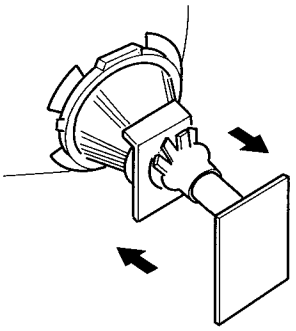


Fig. 1

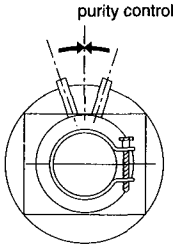


Fig. 2

Perform the adjustments in order as follows
1 Beam Landing
2. Convergence
3. Focus
4. H-line and White Balance

Note: Test Equipment Required.
1 Color bar Pattern Generator
2. Degausser
3. DC Power Supply
4 Digital multimeter

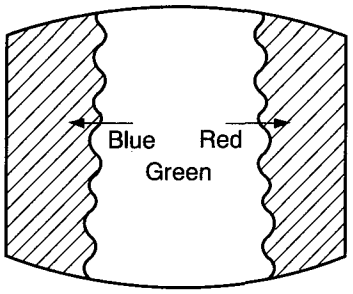


Fig. 3

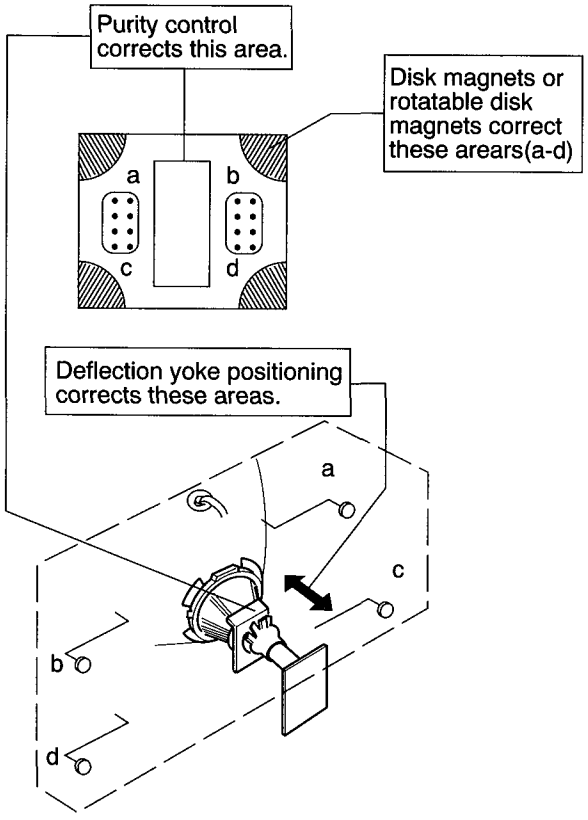


Fig. 4

3-2. CONVERGENCE

Preperation:

- Before starting, perform FOCUS, H.SIZE, V.LIN and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Input a dot signal.

(1) Horizontal and Vertical Static Convergence

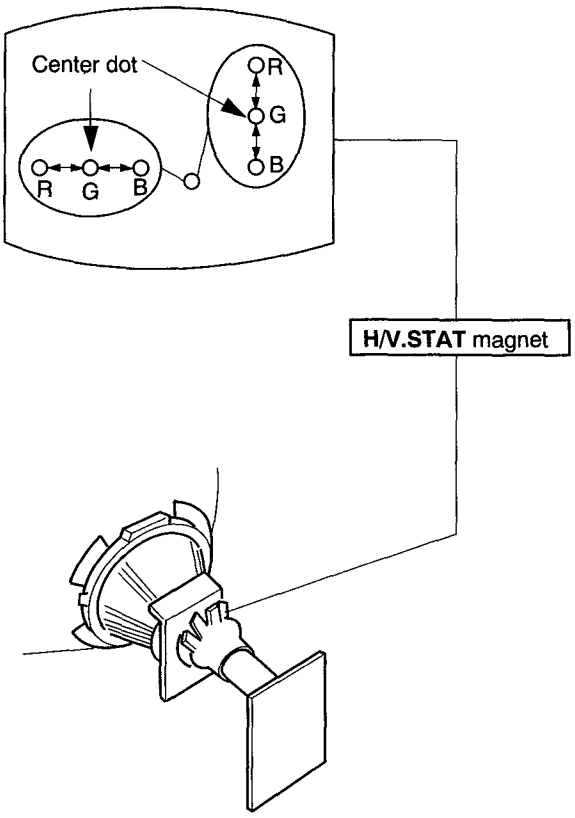
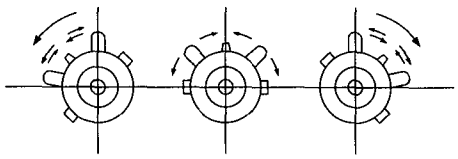
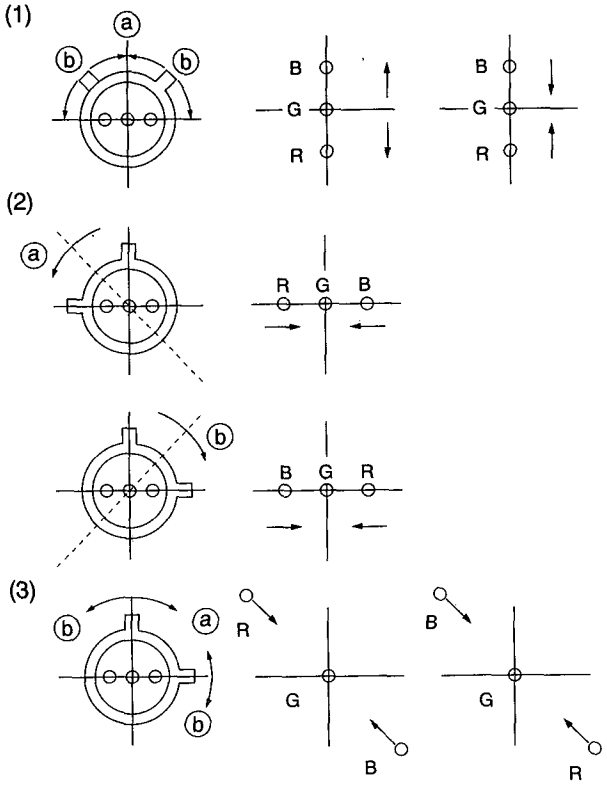


Fig. 5

- Tilt The H/V. STAT magnet and adjust static convergence to open or close the H/V. STAT magnet.



- When the H/V.STAT magnet is move in the direction of arrow ⓐ and ⓑ , red, green and blue dots move as shown below



If the blue dot does not cover with red and green dots, refer to Fig 6 perform the following steps.

1. Move BMC magnet (a) to correct insufficient H. static convergence.
2. Rotate BMC magnet (b) to correct insufficient V. static convergence.
   In either case, repeat Beam Landing Adjustment.

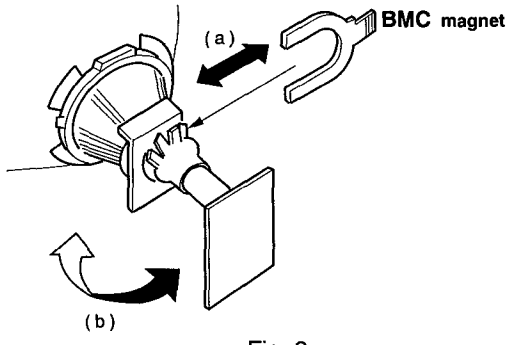


Fig. 6

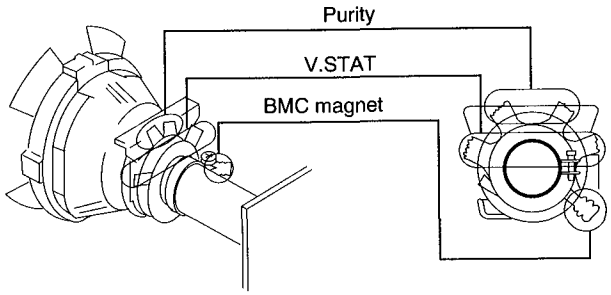


Fig 7

(2) Dynamic Convergence Adjustment

Preparation:

- Before starting, perform Horizontal and Vertical static convergence Adjustment

1. Slightly loosen deflection yoke screw
2. Remove deflection yoke spacers.
3 Move the deflection yoke for best convergence as shown below
4. Tighten the deflection yoke screw.
5 Install the deflection yoke spacers.

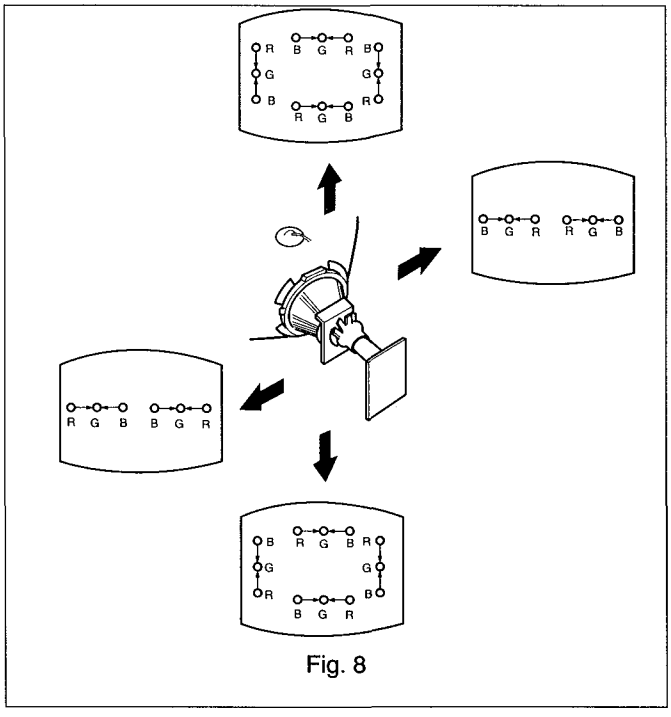


Fig. 8

(3) Screen-corner Convergence

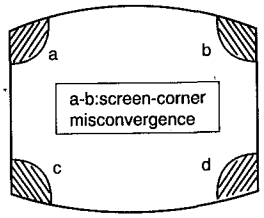
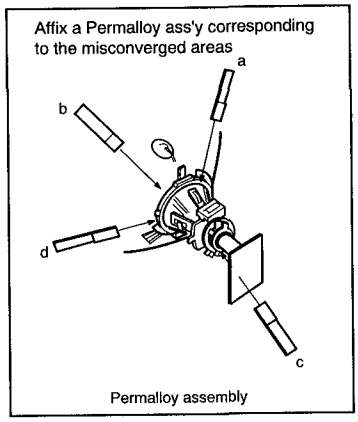


Fig. 9



3-3. FOCUS ADJUSTMENT

- Input Cross Hatch Pattern.
- Turn the focus control (VR1907) knob on the C board to obtain the best focus in the center and circumference.

3-4. SCREEN (G2)

1. Input a dots pattern.
2. Set the PIC, BRT controls at minimum.
3. Supply DC 160V by equipment into R.G. and B cathode.
4. Adjust VR1908 (SCREEN) so that the raster is invisible.

3-5. WHITE BALANCE ADJUSTMENT

1. Input a all white signal.
2. Set the PICTURE to minimum and set the BRIGHT at normal. (Refer to P.12 of this manual for the adjustment.)
3. Turn VR1901 (R.DRIVE) and VR1902 (B.DRIVE) fully clockwise.
4. Adjust BIAS controls for best white balance.
5. Set the PICTURE control to maximum. Observe the screen and adjust the DRIVE controls for best white balance.
6. Repeat steps 4 and 5.

SECTION 4
SAFETY RELATED CHECK

4-1. CIRCUIT CHECK FOR SAFETY

1) Input the color bar signal.
2) Connect a 1/2W, 470KΩ resistor between Q1814-B of D board and GND (J90).
3) As soon as connecting the external resistor, the receiver stops operating (power:relay off). And removing the external resistor, the receiver operates normally when plug in the AC POWER CORD after plugging it out.

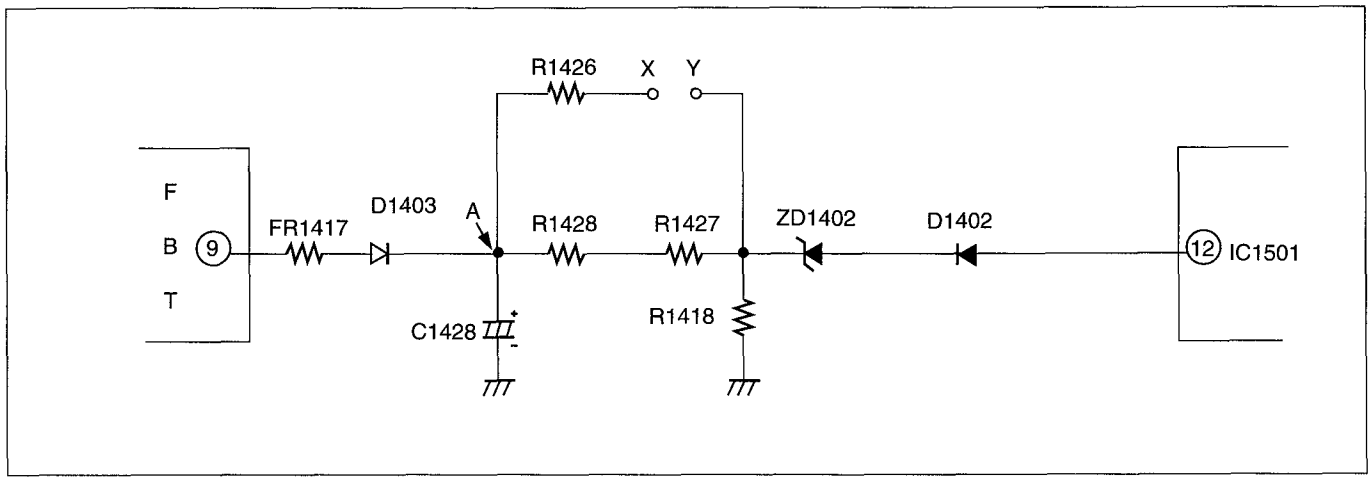
4-2. VERTICAL SHORT CIRCUIT CHECK

1) Input the color bar signal.
2) Short both terminals C1311 from outside.
3) As soon as shorting C1311, the receiver stops operating. And removing the external short, the receiver operates normally.

4-3. HOLD-DOWN CHECK

This procedure should always be performed when replacing the following components (marked with ◢ on the Schematic Diagram). ; **IC1501, ZD1402, T1402, DY**

1) Circuit Diagram



2) Circuit operating explanation.

- **Normal condition**
  DC voltage appears at point X from FBT pulse by rectifying circuit consisted of FR1417, D1403, and C1428. DC voltage of point Y is divided into R1428, R1427, R1418 from DC voltage of point A.
  In normal condition, DC voltage of point Y is lower than 6 volt.
  So the set is operated normally.
- **Abnormal Condition**
  In abnormal condition, DC voltage of point X increase in proportion up to ? volt.
  Therefore, the hold down circuit is operated.
  In result, the horizontal frequency is stopped.

3) Check the X-Ray protection circuit.

a. Turn on the set and connect the color bar signal at the antenna terminal.
b. Check the B+ voltage whether it is correct or not.
c. If B+ is incorrect, power circuit is to be repaired.
d. To check the operation of hold down circuit, short points X and Y .
e. Identify the screen status whether raster is appeared or not.
f. If there is distorted synchronism of screen, the set is OK.
g. Remove the shorted jumper from points X and Y.

4) Troubleshooting the Hold-Down circuit.

Shorting points Xand Y, check the voltage of point Y.

- If the voltage is below 6V DC, check ZD1404, C1428, L1406, R1419, FR1417, and D1403 and replace defective one.
- If the voltage is over 6V DC, C1405, R1405, IC1501 and replace defective one.

SECTION 5
CIRCUIT ADJUSTMENT (TV & VIDEO)

5-1. TV Part

1. H-LINE ADJUSTMENT

1) Preliminary Steps
- Input the standard White Signal.
- Set screen to standard condition.
- Set the red and blue driver (VR1901, 1902) to the mechanical center.
- Set the Bias controls (VR1903, 1904, 1905) to the mechanical a third position. (Min.-Max.)
- Make H-line by setting SW1201 to the center position.

2) Adjustment
- Turn the Screen volume knob counterclockwise until the first horizontal line appears in the picture screen.
- Adjust two color bias controls for the colors which do not appear in the horizontal line so that the horizontal line becomes white.
- In state of the horizontal line is white, adjust screen volume so that the brightness of H-LINE become 0.3ft-L or so.
- Adjust SW1201 to the first position for the screen to appear.

2. H-CENTER ADJUSTMENT
- Input the color bar signal.
- Set screen to the standard condition.
- Set the horizontal-center control VR1401 so that right side and left side of the picture are equal. (horizontal center)

3. V-SIZE & V-CENTER ADJUSTMENT
- Input the Color bar signal.
- Set screen to normal position.
- Set screen to center of CRT by converting SW1301.
- Adjust the vertical size (VR1301) for approximately 1/2" overscan at the top and bottom of the display.

4. SUB-BRIGHT ADJUSTMENT
- Input the color bar signal.
- Push the MENU Key of the remote commander.
- Adjust VR1201 so that the step 2 and 3 are differentiated of sub-bright of pattern.
- Push the MENU Key of the remote commander again that the picture goes back to normal.

5. AGC ADJUSTMENT
1. Input the color-bar signal.
2. Adjust AGC VR of TU101 so that snow noise and cross-modulation disappear from the picture.
3. Confirm them at every channel.

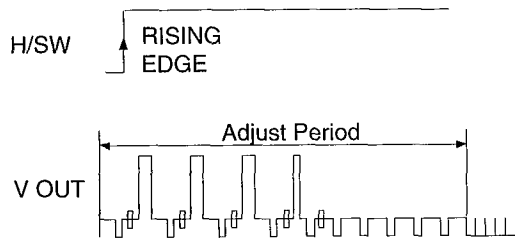
5-2. Video Part

This adjustment must be operate after DECK adjusting is finished

1. PG ADJUSTMENT

1) Necessary Instruments
1) TAPE for exclusive use of SP
2) Oscilloscope
3) 10 1Probe

2) Adjustment
1) PLAY exclusive use of SP tape
2) Connect oscilloscope (CH-1) to MAIN PCB J532 (H/SW) and VOL/DIV to 1V Range Trigger
3) Connect oscilloscope (CH-2) to MAIN PCB J601 (Video Out) and set it VOL/DIV 500mV Range
4) Set TIME/DIV of oscilloscope to 50 us Range
5) Adjust VR501 so that V-sync Falling Edge of Video signal become 412 usec±20usec.



<Waveform of adjustment>

* **CAUTION:** Set oscilloscope trigger mode to DC

2. NORMAL REC BIAS LEVEL ADJUSTMENT

1) Necessary Instruments
1) Recording Tape
2) RMS Meter

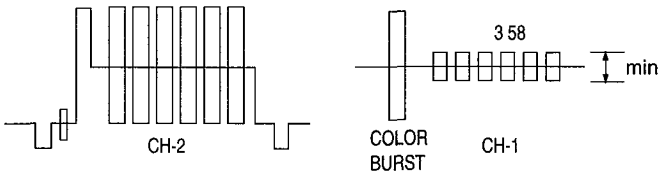
2) Adjustment
1) Convert SET to A/V input mode
2) Insert recording tape and press REC button
3) Connect RMS Meter's (+), (-) to MAIN PCB R606 both endsl respectively
4) At this time, adjust VR601 so that the RMS Meter's indicator become within 3.0mV±0 1mV

3. Y/C SEP. ADJUSTMENT

1) Necessary Instrument
1) Oscilloscope
2) 10 1Probe 2EA
3) Pattern Generator (Multi-Burst Signal)
4) Recording Tape

2) Adjustment
1) Input Multi-Burst signal (100%) of patern generator to Video in Jack
2) Turn the set to A/V MODE
3) Press REC button with insert recording Tape
4) Connect oscilloscope (CH-1) to MAIN PCB J473 (RF)
5) Connect oscilloscope (CH-2) to MAIN PCB J601 (V-OUT) and trigger in order to it indicates adout 2H

6) Set CH-1 of oscilloscope to 20mV Range, and adjust VR401 so that the (3 58MHz) Y component of rest multi-burst signal become minimum



<Adjustment Waveform>

SECTION 6
VCR DECK ADJUSTMENT

This adjustment must be operated after the assembling is finished as Chassis assy

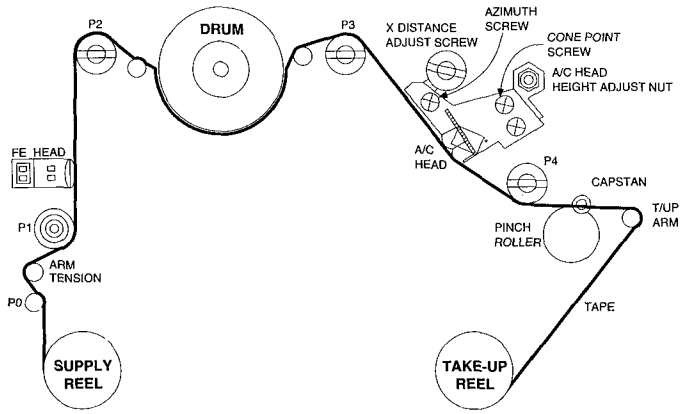
1. TAPE PATH ADJUSTMENT

1) Necessary Instruments

1) TAPE for exclusive use of SP
2) Osilloscope
3) 10 1 Probe 2EA
4) Particular Driver for adjustment
(P2, P3, X-distance control, Audio (NUT) control)
5) RMS Meter (Audio Level Meter)

2) Preliminary Steps

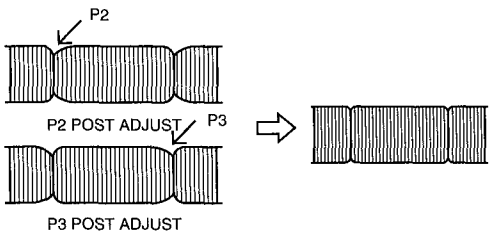
1) Connect oscilloscope (CH-1) to MAIN PCB J532(H/SW) (for Trigger of CH-2).
2) Connect oscilloscope (CH-2) to MAIN PCB J473(RF). (When adjusting, use CH-2 waveform)
3) PLAY by insert TAPE for exclusive use of SP
4) As soon as the caption 'AUTO TRK' is appeared after play, make TRACKING intializtion by press tracking control up(+) button of Remocon



<Adjust Parts Location>

3) Confirm the RF linearity and adjustment

1) Adjust P2 & P3 so that the waveform is maximum and stablized with viewing RF ENVELOPE waveform of SCOPE
2) Confirm ENVELOPE waveform is controlled to maximum by press TRK UP(+), DOWN(-) button step by step



<Adjustment waveform>

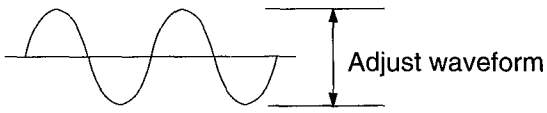
4) X-Distance Adjustment

1) Adjust Cone Screw of the DECK so that the RF waveform is maximum
2) Confirm that the RF waveform satisfy linearity by adjust TRK UP(+), DOWN(-) button step by step

CAUTION: To treat the 'POOR', when the RF waveform is maximum as turn the Cone Screw more than 2 wheel (2 turns; 720°)

5) Audio Level Confirmation and Adjustment

1) Connect RMS Merer (Audio Level Meter) "+" terminal to MAIN PCB R620 and "-" terminal to GND, respectively.
2) Confirm that the RMS Meter's Audio Level satisfy the following spec and fine control Azimuth Screw of A/C Head in Audio reduction.
3) Audio Level Spec 1K, -7 8dBm ± 3dBm
7K, (1KHz) + 3, - 5dBm

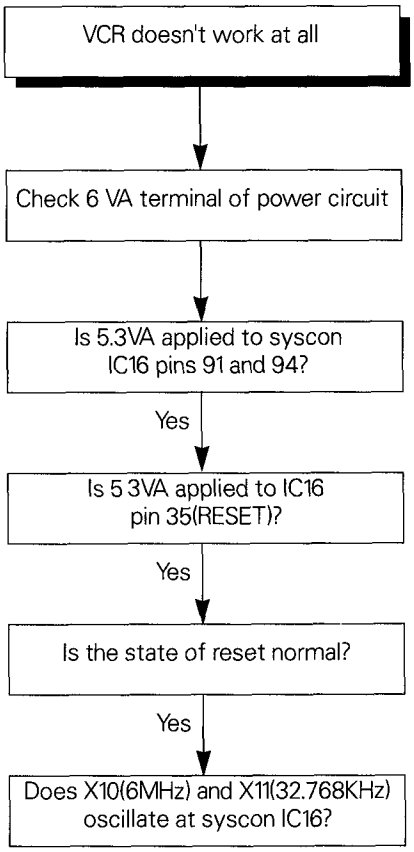


<Adjustment Wavefrom>

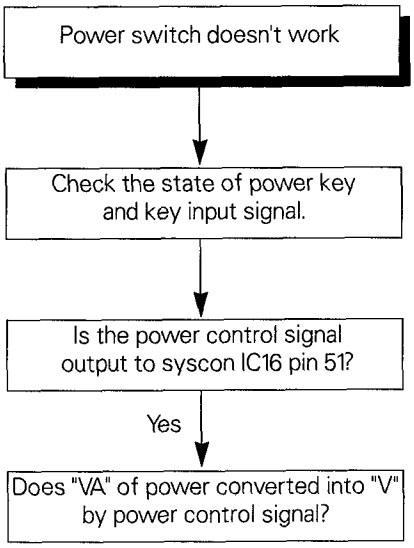
SECTION 7
TROUBLESHOOTING CHARTS

7-1. System Control Part.

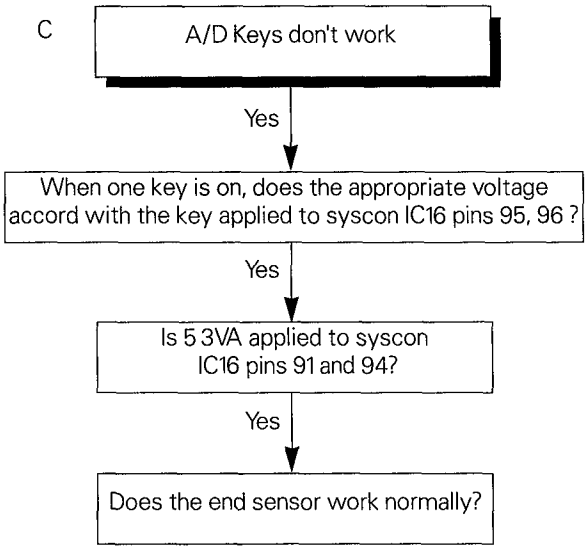
A


VCR doesn't work at all
Check 6 VA terminal of power circuit
Is 5.3VA applied to syscon IC16 pins 91 and 94?
Yes
Is 5 3VA applied to IC16 pin 35(RESET)?
Yes
Is the state of reset normal?
Yes
Does X10(6MHz) and X11(32.768KHz) oscillate at syscon IC16?

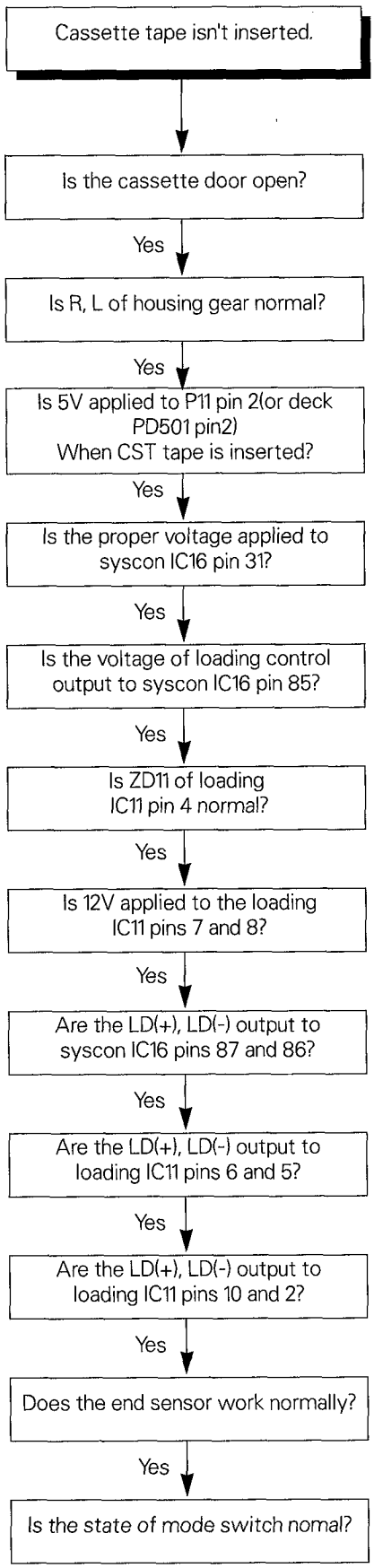
B


Power switch doesn't work
Check the state of power key and key input signal.
Is the power control signal output to syscon IC16 pin 51?
Yes
Does "VA" of power converted into "V" by power control signal?

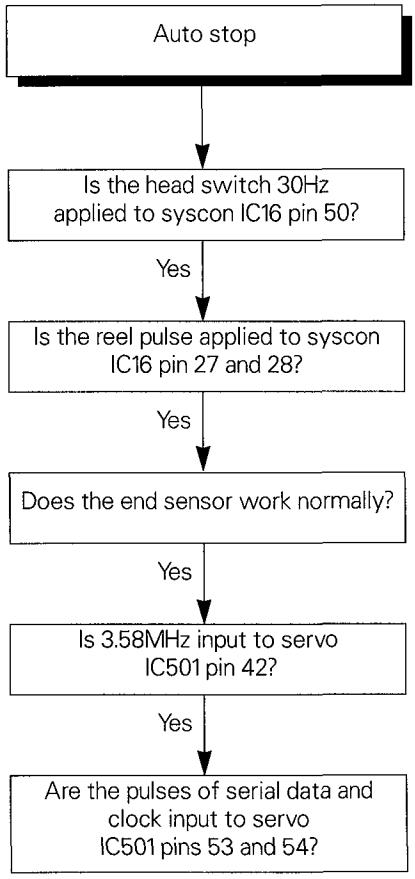
C


A/D Keys don't work
Yes
When one key is on, does the appropriate voltage accord with the key applied to syscon IC16 pins 95, 96 ?
Yes
Is 5 3VA applied to syscon IC16 pins 91 and 94?
Yes
Does the end sensor work normally?

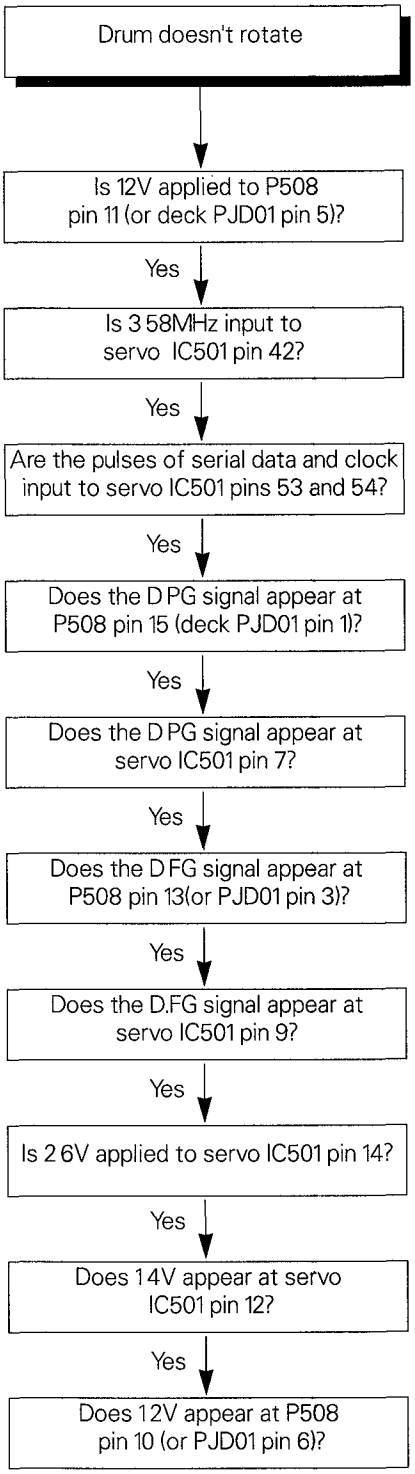
D


Cassette tape isn't inserted.
Is the cassette door open?
Yes
Is R, L of housing gear normal?
Yes
Is 5V applied to P11 pin 2(or deck PD501 pin2) When CST tape is inserted?
Yes
Is the proper voltage applied to syscon IC16 pin 31?
Yes
Is the voltage of loading control output to syscon IC16 pin 85?
Yes
Is ZD11 of loading IC11 pin 4 normal?
Yes
Is 12V applied to the loading IC11 pins 7 and 8?
Yes
Are the LD(+), LD(-) output to syscon IC16 pins 87 and 86?
Yes
Are the LD(+), LD(-) output to loading IC11 pins 6 and 5?
Yes
Are the LD(+), LD(-) output to loading IC11 pins 10 and 2?
Yes
Does the end sensor work normally?
Yes
Is the state of mode switch nomal?

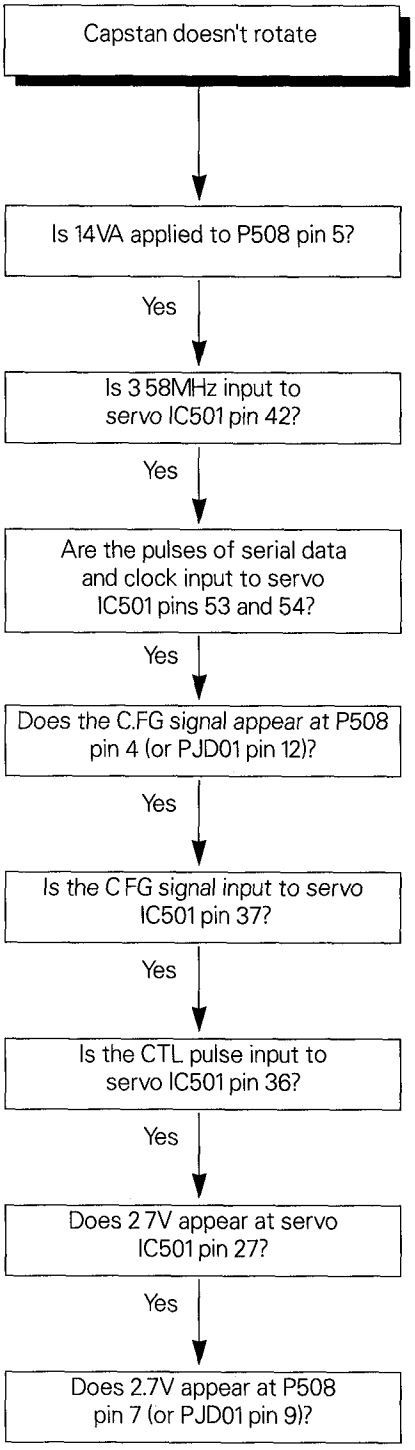
E.


Auto stop
Is the head switch 30Hz applied to syscon IC16 pin 50?
Yes
Is the reel pulse applied to syscon IC16 pin 27 and 28?
Yes
Does the end sensor work normally?
Yes
Is 3.58MHz input to servo IC501 pin 42?
Yes
Are the pulses of serial data and clock input to servo IC501 pins 53 and 54?

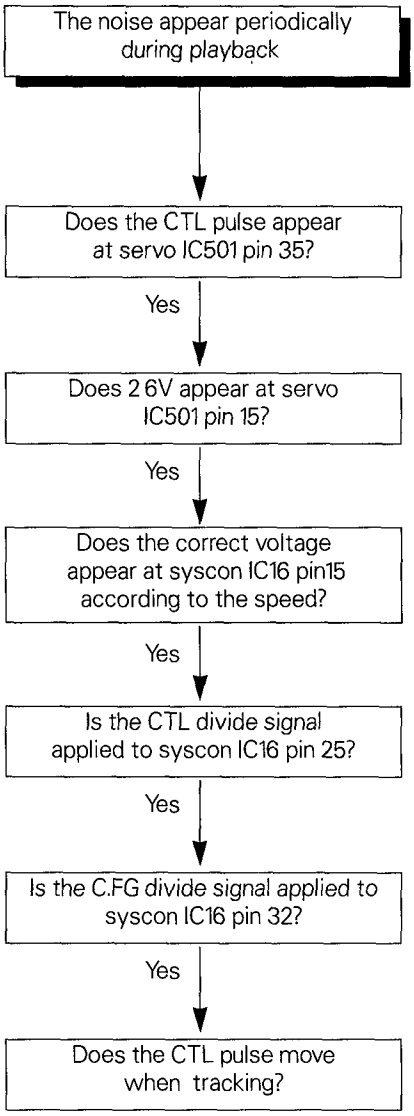
F


Drum doesn't rotate
Is 12V applied to P508 pin 11 (or deck PJD01 pin 5)?
Yes
Is 3 58MHz input to servo IC501 pin 42?
Yes
Are the pulses of serial data and clock input to servo IC501 pins 53 and 54?
Yes
Does the D PG signal appear at P508 pin 15 (deck PJD01 pin 1)?
Yes
Does the D PG signal appear at servo IC501 pin 7?
Yes
Does the D FG signal appear at P508 pin 13(or PJD01 pin 3)?
Yes
Does the D.FG signal appear at servo IC501 pin 9?
Yes
Is 2 6V applied to servo IC501 pin 14?
Yes
Does 1 4V appear at servo IC501 pin 12?
Yes
Does 1 2V appear at P508 pin 10 (or PJD01 pin 6)?

G

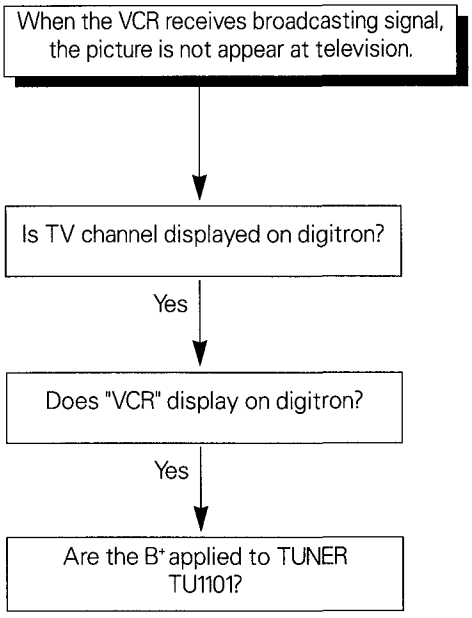

Capstan doesn't rotate
Is 14VA applied to P508 pin 5?
Yes
Is 3 58MHz input to servo IC501 pin 42?
Yes
Are the pulses of serial data and clock input to servo IC501 pins 53 and 54?
Yes
Does the C.FG signal appear at P508 pin 4 (or PJD01 pin 12)?
Yes
Is the C FG signal input to servo IC501 pin 37?
Yes
Is the CTL pulse input to servo IC501 pin 36?
Yes
Does 2 7V appear at servo IC501 pin 27?
Yes
Does 2.7V appear at P508 pin 7 (or PJD01 pin 9)?

H

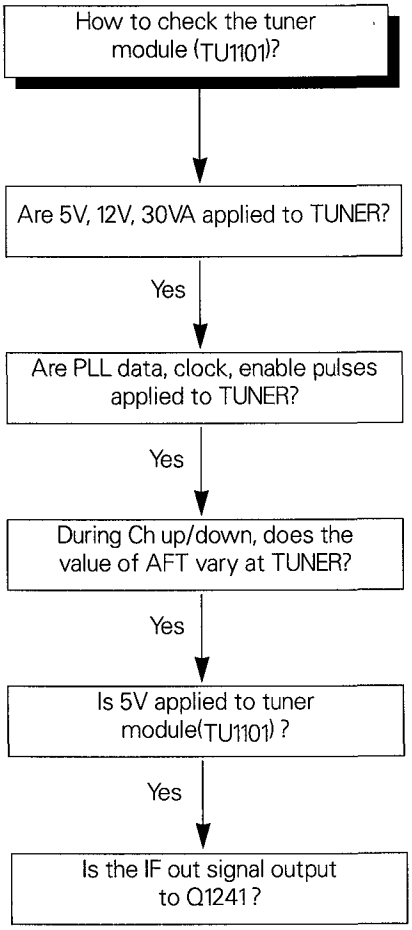

The noise appear periodically during playback
Does the CTL pulse appear at servo IC501 pin 35?
Yes
Does 2 6V appear at servo IC501 pin 15?
Yes
Does the correct voltage appear at syscon IC16 pin15 according to the speed?
Yes
Is the CTL divide signal applied to syscon IC16 pin 25?
Yes
Is the C.FG divide signal applied to syscon IC16 pin 32?
Yes
Does the CTL pulse move when tracking?

7-2. Video Part.

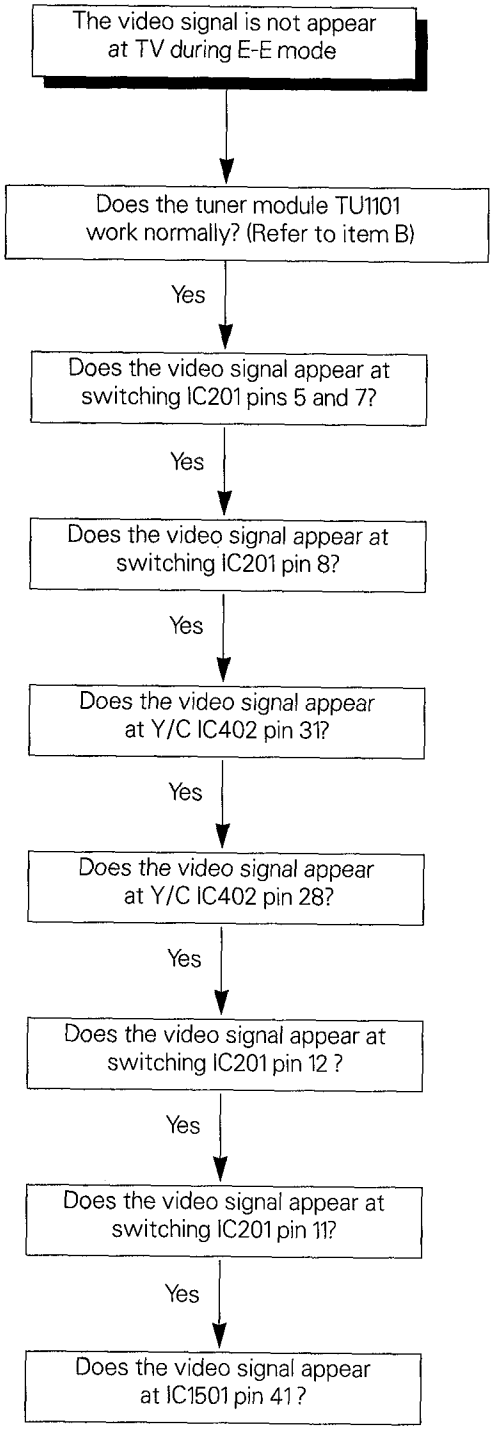
A


When the VCR receives broadcasting signal, the picture is not appear at television.
Is TV channel displayed on digitron?
Yes
Does "VCR" display on digitron?
Yes
Are the B+ applied to TUNER TU1101?

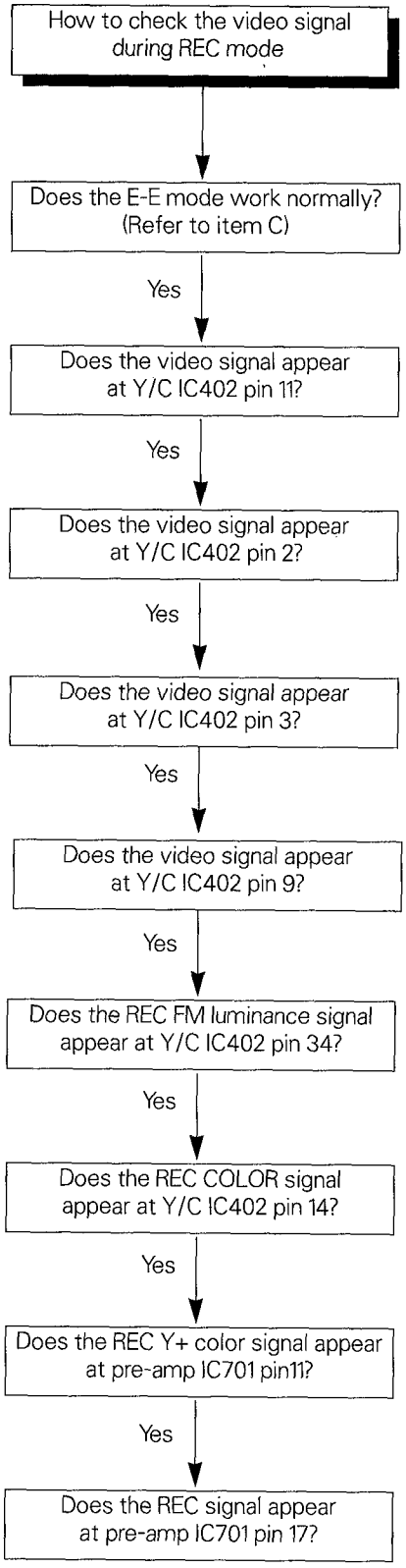
B.


How to check the tuner module (TU1101)?
Are 5V, 12V, 30VA applied to TUNER?
Yes
Are PLL data, clock, enable pulses applied to TUNER?
Yes
During Ch up/down, does the value of AFT vary at TUNER?
Yes
Is 5V applied to tuner module(TU1101) ?
Yes
Is the IF out signal output to Q1241 ?

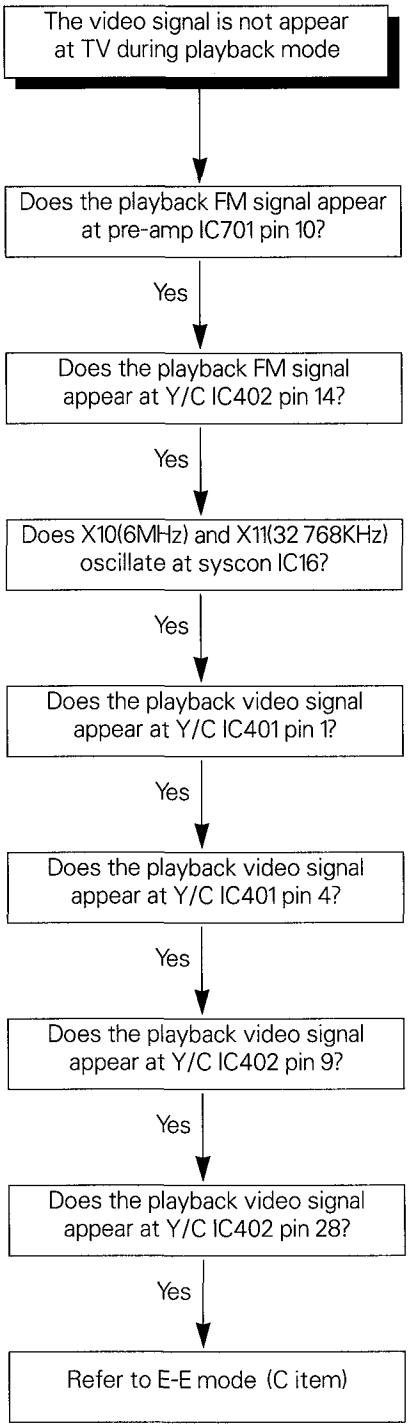
C


The video signal is not appear at TV during E-E mode
Does the tuner module TU1101 work normally? (Refer to item B)
Yes
Does the video signal appear at switching IC201 pins 5 and 7?
Yes
Does the video signal appear at switching IC201 pin 8?
Yes
Does the video signal appear at Y/C IC402 pin 31?
Yes
Does the video signal appear at Y/C IC402 pin 28?
Yes
Does the video signal appear at switching IC201 pin 12 ?
Yes
Does the video signal appear at switching IC201 pin 11?
Yes
Does the video signal appear at IC1501 pin 41 ?

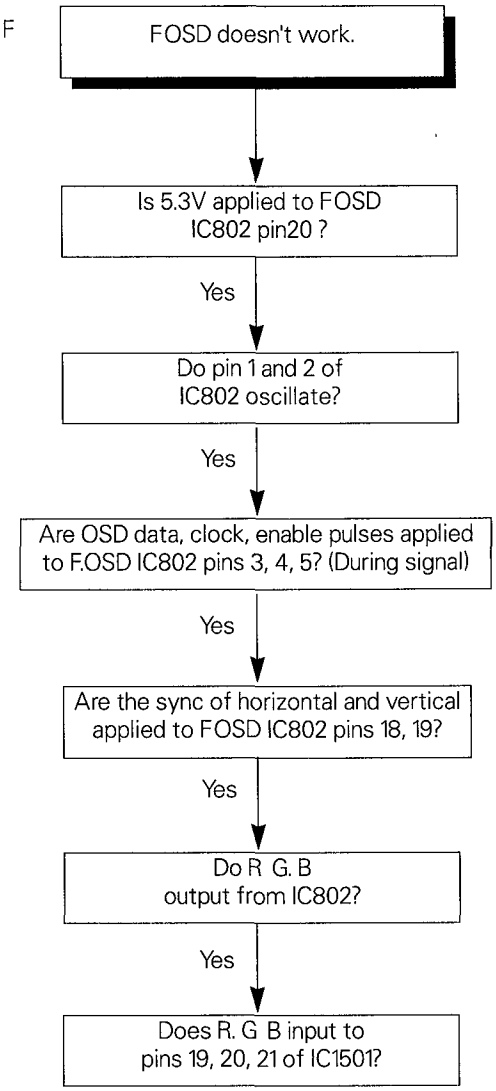
D.


How to check the video signal during REC mode
Does the E-E mode work normally? (Refer to item C)
Yes
Does the video signal appear at Y/C IC402 pin 11?
Yes
Does the video signal appear at Y/C IC402 pin 2?
Yes
Does the video signal appear at Y/C IC402 pin 3?
Yes
Does the video signal appear at Y/C IC402 pin 9?
Yes
Does the REC FM luminance signal appear at Y/C IC402 pin 34?
Yes
Does the REC COLOR signal appear at Y/C IC402 pin 14?
Yes
Does the REC Y+ color signal appear at pre-amp IC701 pin11?
Yes
Does the REC signal appear at pre-amp IC701 pin 17?

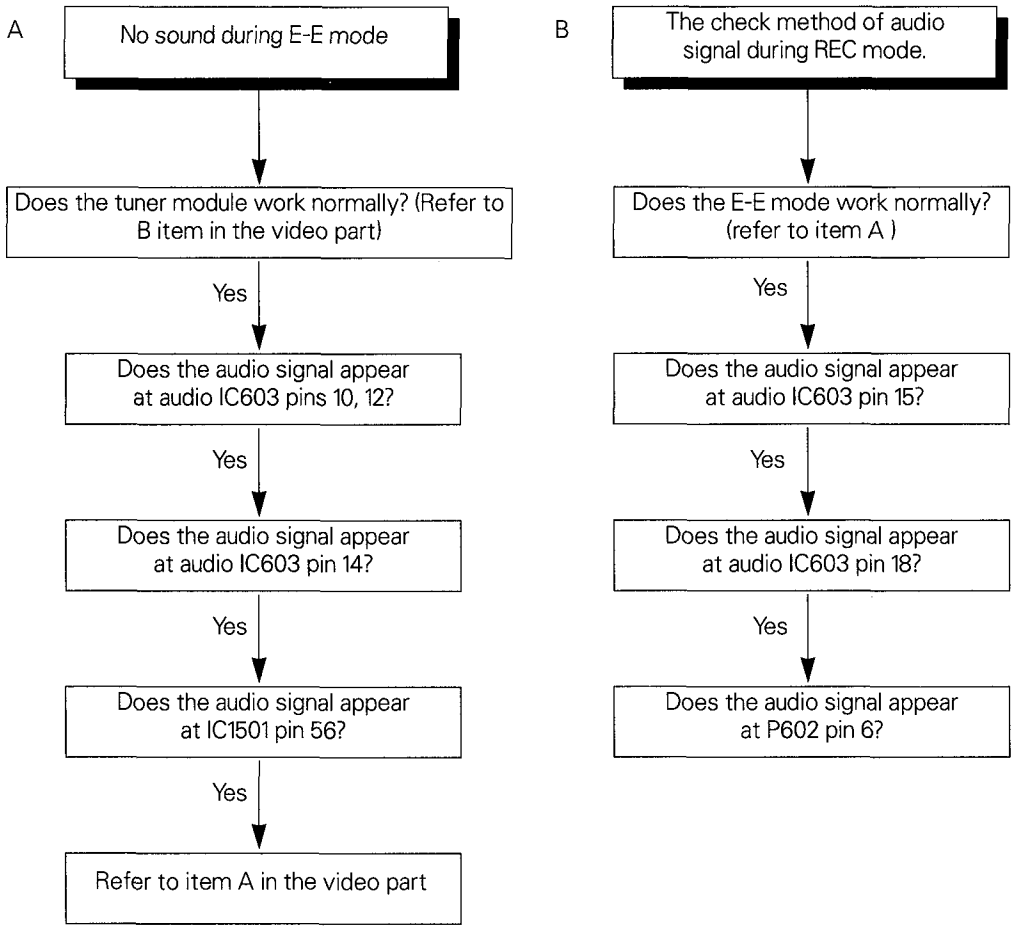
E


The video signal is not appear at TV during playback mode
Does the playback FM signal appear at pre-amp IC701 pin 10?
Yes
Does the playback FM signal appear at Y/C IC402 pin 14?
Yes
Does X10(6MHz) and X11(32 768KHz) oscillate at syscon IC16?
Yes
Does the playback video signal appear at Y/C IC401 pin 1?
Yes
Does the playback video signal appear at Y/C IC401 pin 4?
Yes
Does the playback video signal appear at Y/C IC402 pin 9?
Yes
Does the playback video signal appear at Y/C IC402 pin 28?
Yes
Refer to E-E mode (C item)

F


FOSD doesn't work.
Is 5.3V applied to FOSD IC802 pin20 ?
Yes
Do pin 1 and 2 of IC802 oscillate?
Yes
Are OSD data, clock, enable pulses applied to F.OSD IC802 pins 3, 4, 5? (During signal)
Yes
Are the sync of horizontal and vertical applied to FOSD IC802 pins 18, 19?
Yes
Do R G. B output from IC802?
Yes
Does R. G B input to pins 19, 20, 21 of IC1501?

7-3. Audio part.


A
No sound during E-E mode
Does the tuner module work normally? (Refer to B item in the video part)
Yes
Does the audio signal appear at audio IC603 pins 10, 12?
Yes
Does the audio signal appear at audio IC603 pin 14?
Yes
Does the audio signal appear at IC1501 pin 56?
Yes
Refer to item A in the video part
B
The check method of audio signal during REC mode.
Does the E-E mode work normally? (refer to item A)
Yes
Does the audio signal appear at audio IC603 pin 15?
Yes
Does the audio signal appear at audio IC603 pin 18?
Yes
Does the audio signal appear at P602 pin 6?

KV-20/13VM30/31
RM-Y138/W

C.

No sound during playback mode.

↓

Does the playback audio signal appear at audio IC603 pin 2?

Yes

↓

Does the playback audio signal appear at audio IC603 pin 7?

Yes

↓

Does the playback audio signal appear at audio IC603 pin 8?

Yes

↓

Does the playback audio signal appear at audio IC603 pin 14?

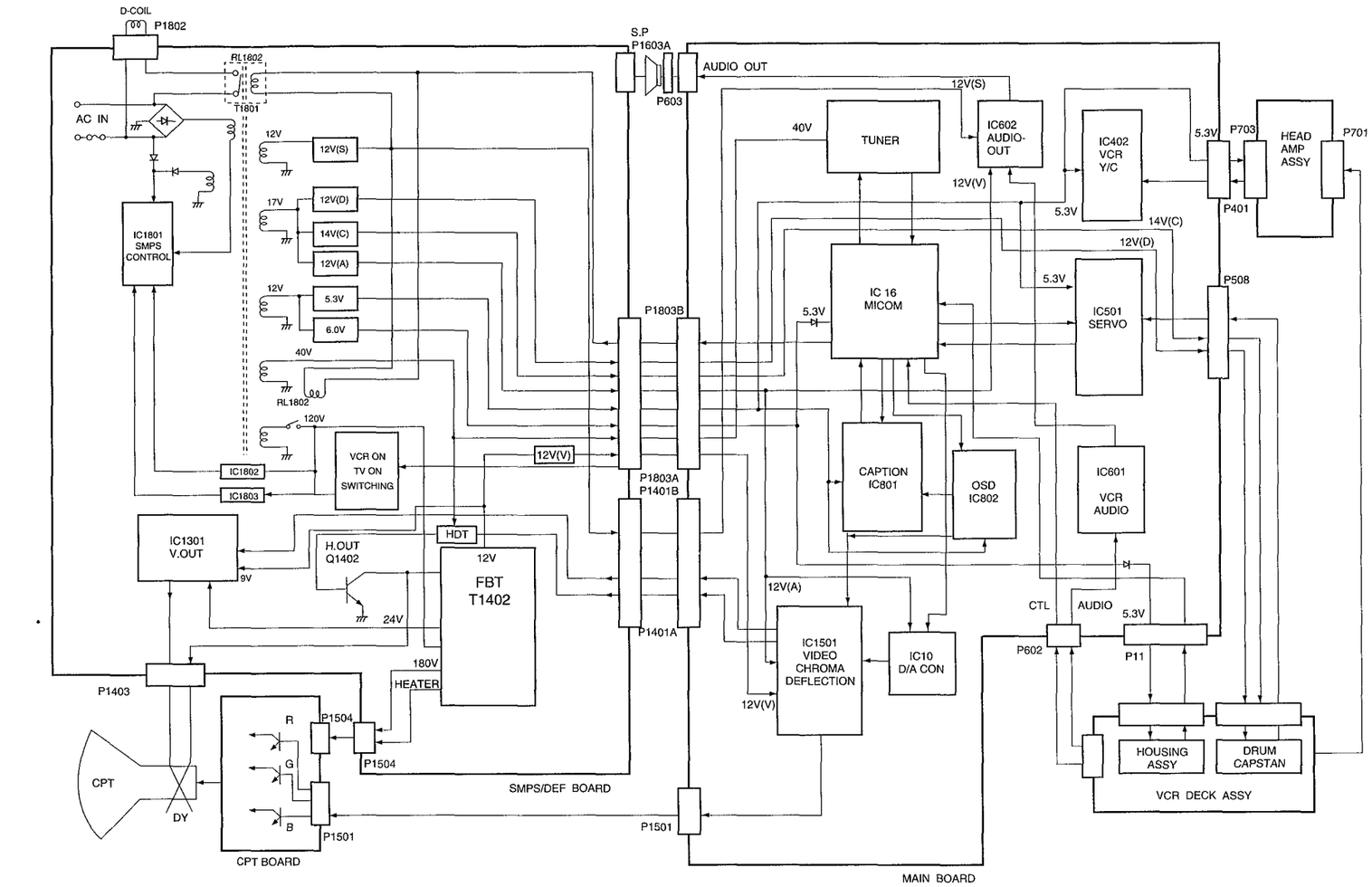
Yes

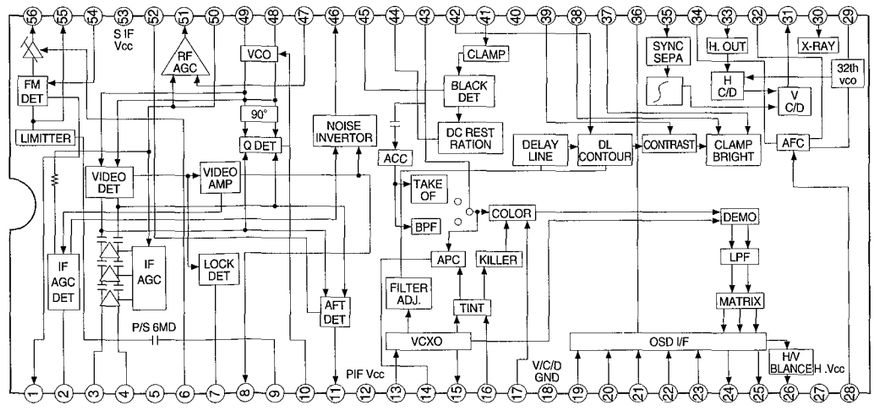
↓

Refer to E-E mode (item A).

SECTION 8
DIAGRAMS

8-1. Block Diagram

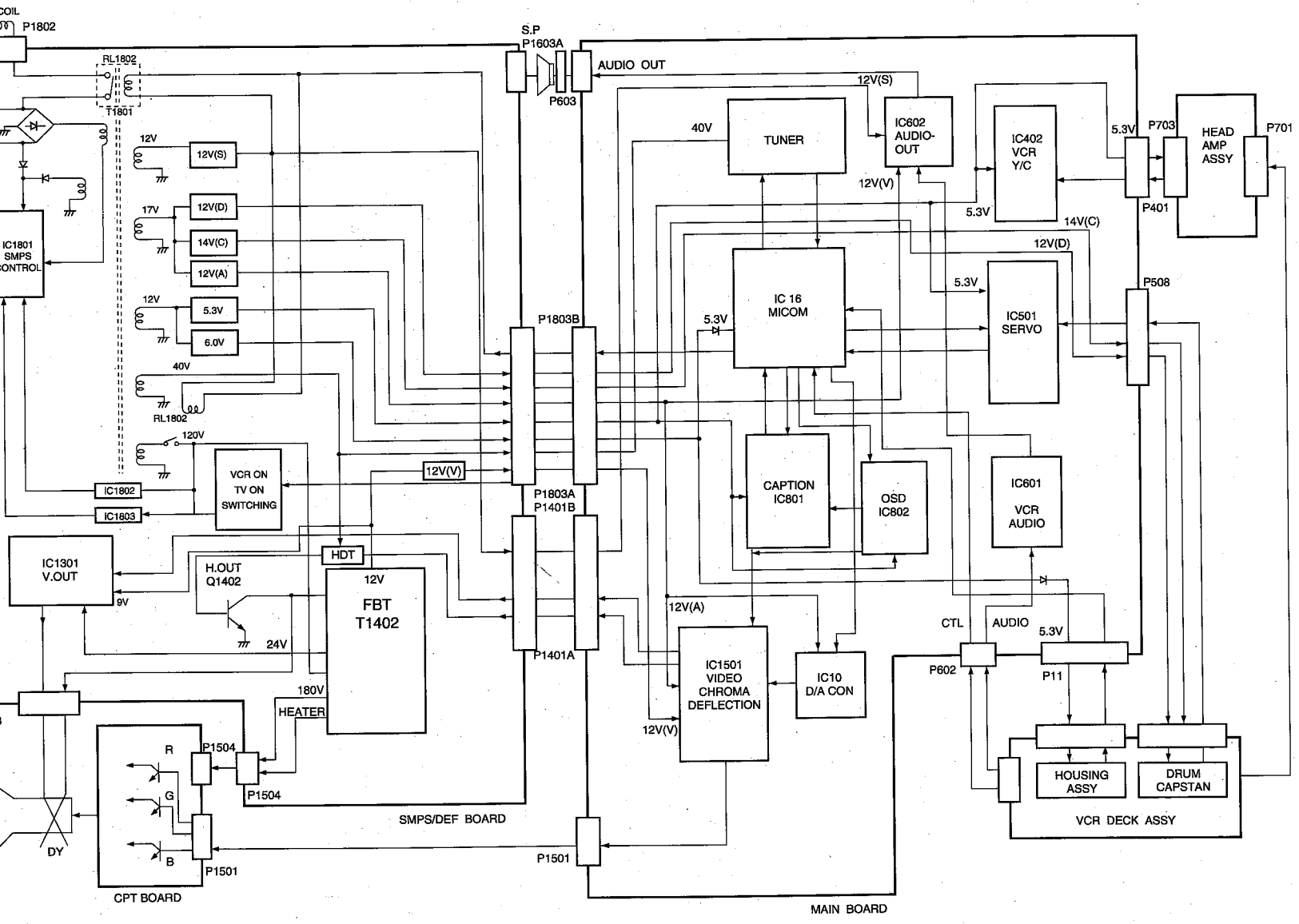


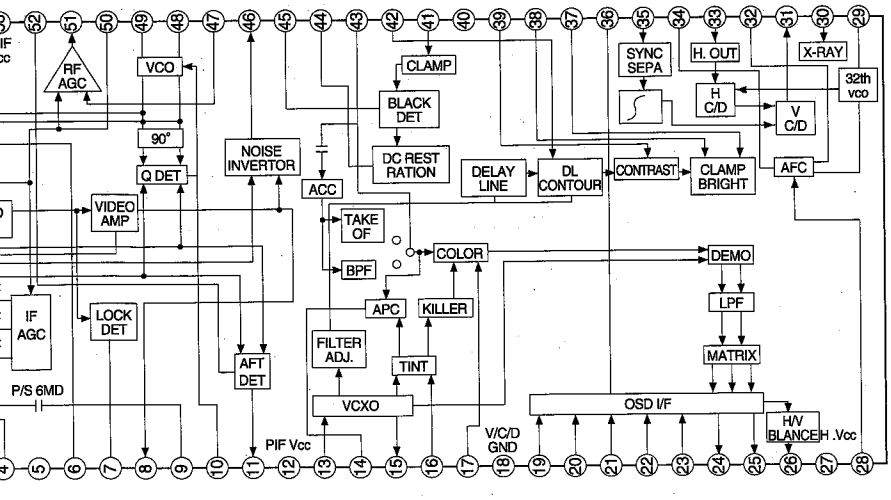


Block Diagram of TA8825AN

SECTION 8
DIAGRAMS

Diagram

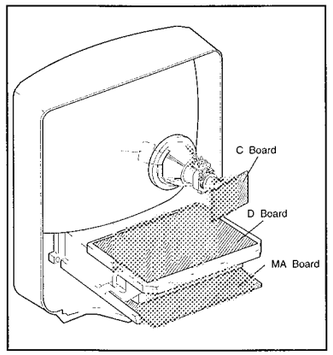




Block Diagram of TA8825AN

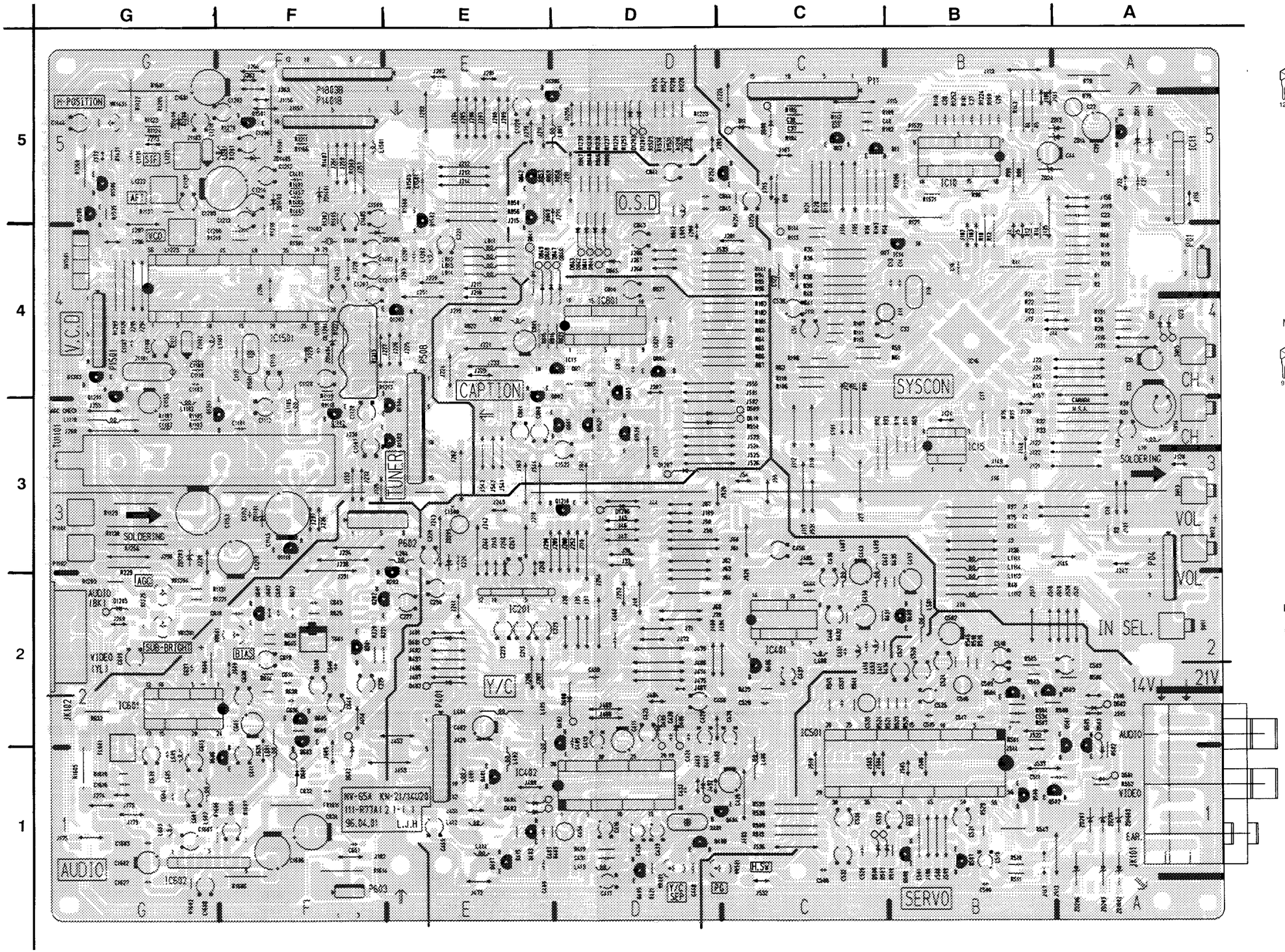
KV-20/13VM30/31
RM-Y138/W

8-2. Circuit Boards Location & Printed Wiring Boards

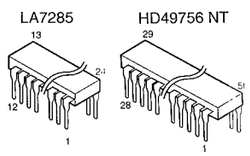


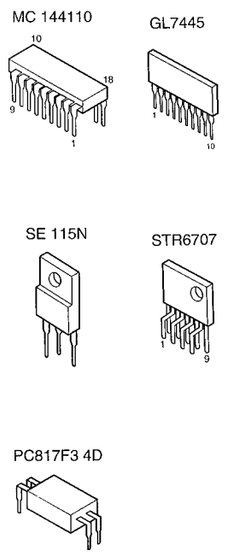
MA BOARD

IC		Q1520	D-3
IC10	F-1	Q1521	D-3
IC11	G-1	**DIODE**	
IC14	F-2	D10	E-2
IC15	F-3	D21	G-2
IC16	F-2	D23	G-2
IC201	C-4	D401	C-4
IC401	E-4	D402	C-4
IC402	D-5	D403	C-5
IC501	F-4	D404	C-5
IC601	B-4	D405	D-5
IC602	B-5	D406	D-5
IC801	D-2	D407	D-5
IC802	D-1	D408	D-4
IC1501	A-2	D501	G-5
TRANSISTOR		D502	G-4
Q10	G-1	D503	G-4
Q11	E-1	D506	E-5
Q12	E-1	D507	E-5
Q201	B- 4	D508	E-1
Q202	B- 4	D509	E-3
Q203	C-4	D510	E-3
Q401	C-5	D601	B-4
Q402	D-5	D602	B-4
Q403	C-5	D841	D-2
Q404	E-5	D842	D-2
Q405	D-5	D843	D-2
Q406	E-4	D844	D-2
Q407	C-5	D845	D-2
Q408	D-5	D846	D-2
Q409	F-4	D847	C-2
Q501	G-4	D848	C-2
Q502	F-5	D849	C-2
Q503	F-4	D1202	D-1
Q504	F-4	D1203	D-1
Q505	G-5	D1205	A-4
Q506	F-5	ZD12	G-1
Q507	F-5	ZD24	F-1
Q508	F-5	ZD203	G-5
Q601	B-4	ZD204	G-5
Q603	B-4	ZD205	C-4
Q605	B-4	ZD206	G-5
Q606	B-5	ZD207	G-5
Q801	D-3	ZD1101	B-3
Q802	C-3	ZD1203	A-3
Q841	C-1	ZD1401	B-1
Q842	C-1	ZD1403	B-2
Q1101	A-3	ZD1404	B-2
Q1102	B-3	ZD1405	B-1
Q1202	B-2	ZD1406	A-1
Q1205	A-1	ZD1506	C-2
Q1206	D-1	ZD1601	A-5
Q1207	C-2	ZD1602	G-5
Q1241	B-3	ZD1603	G-5
Q1252	D-1	**TRANSFORMER**	
Q1501	B-1	T601	B-4
Q1502	C-2		
Q1503	C-3		
Q1504	C-3		
Q1506	A-1		

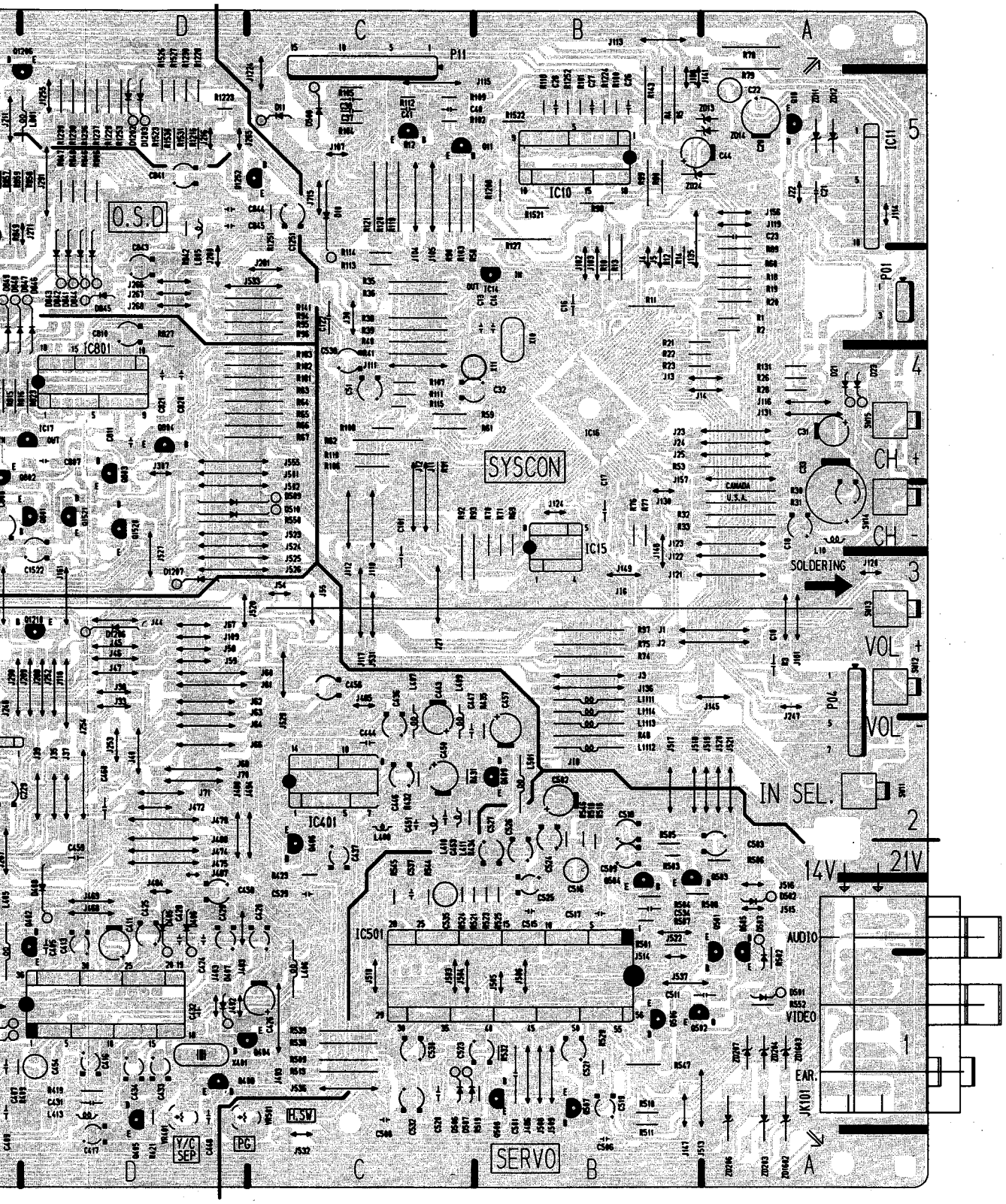


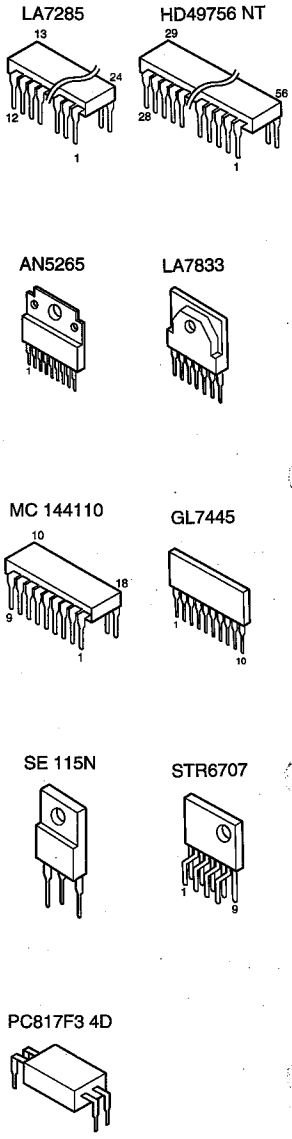
8-3. Semiconductors





8-3. Semiconductors

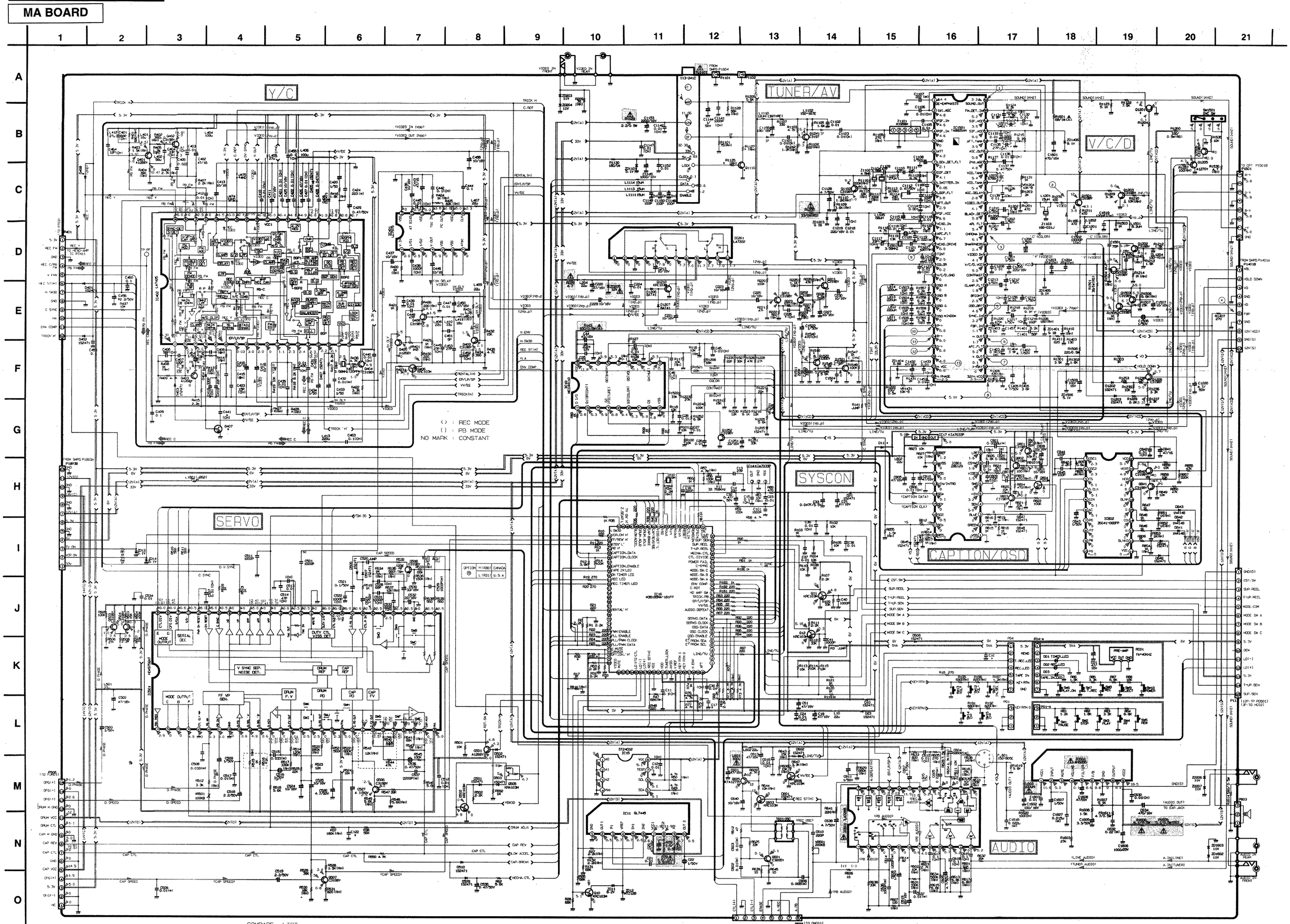




8-4. Schematic Diagrams & Printed Wiring Boards

CAUTION
Four parts which are marked with ⚠ on the schematic diagram are replacement parts in the "HOLD-DOWN CHECK"
IC1501, ZD1402, T1402, DY

MA BOARD



COMPARE LIST

	20VH30	13VH30
R1229	2.2K	TIN WIRE
R1503	1.0K	470
R1218	10K	9.1K
R1230	10K	3.9K
R1216	12K	15K

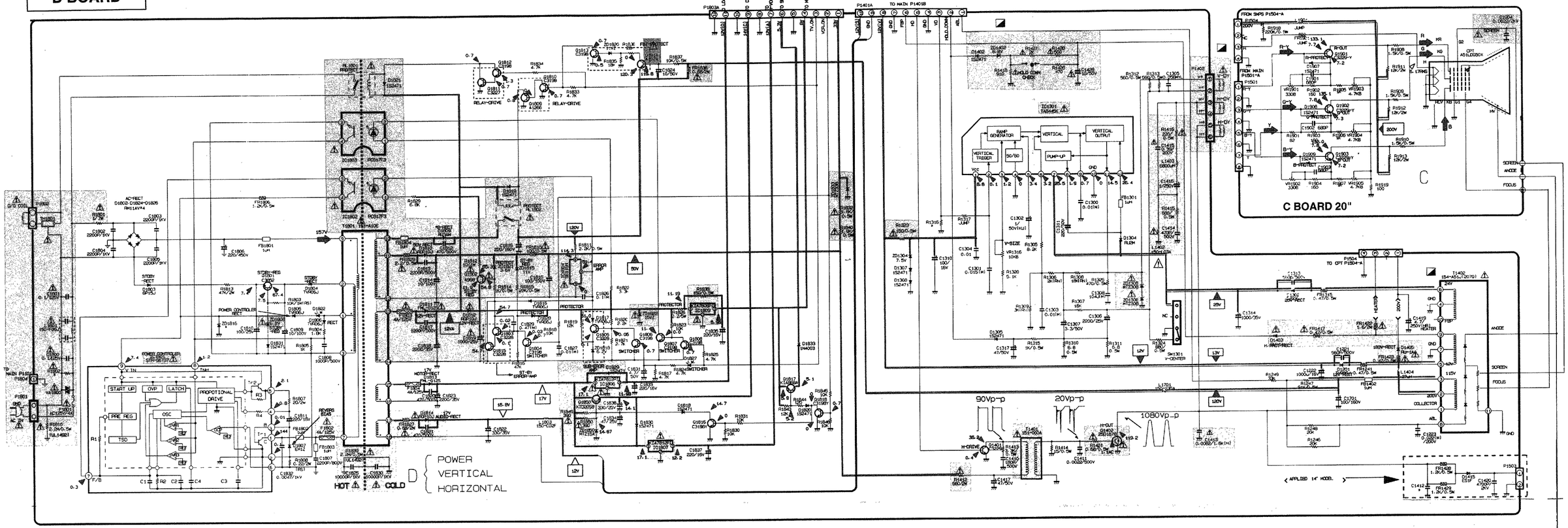
	20VH30	13VH30
R1238	12K	3.3K
R1530	12K	3.0K
R1230	22K	30K
R1253	22K	6.2K
R1521	22K	3.6K

	20VH30	13VH30
R1223	27K	56K
R1527	30K	20K
R1224	100K	150K
L1201	15uH	10uH
C1401	12pF/50V	56pF/50V

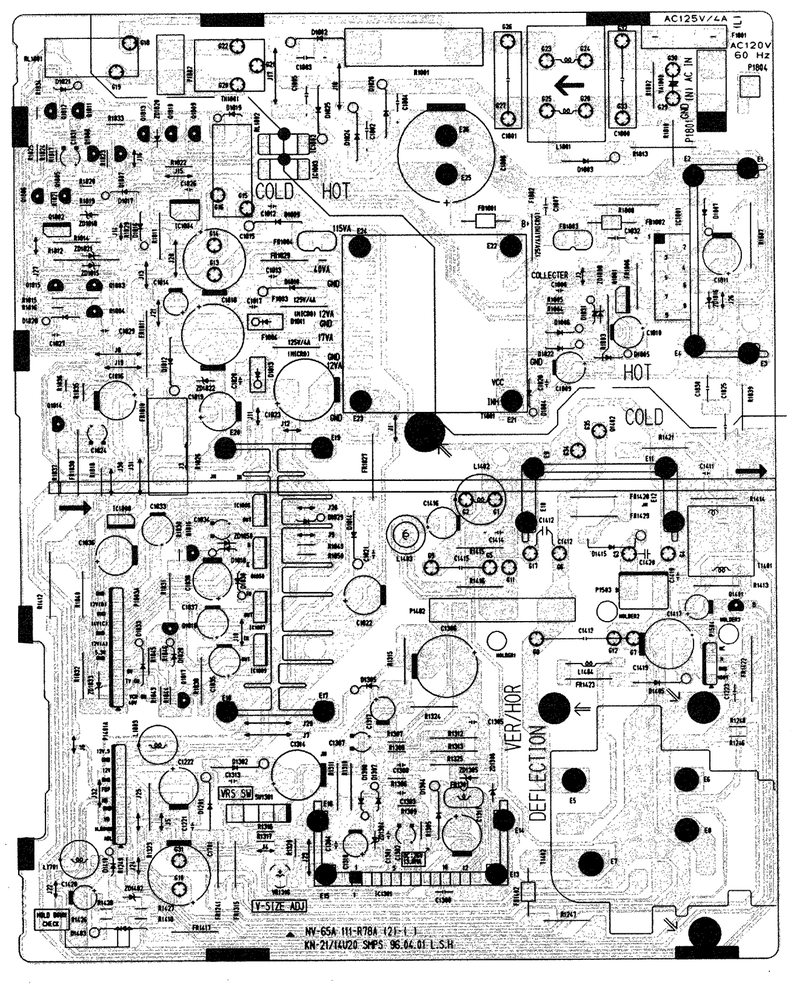
	20VH30	13VH30
C1502	100uF/16V(STD)	330uF/16V(STD)
C1209	220uF/16V(STD)	2200uF/10V
C1220	4.7uF/50V(SPE)	10uF/16V(SPE)
Z1104	-	3.5SH

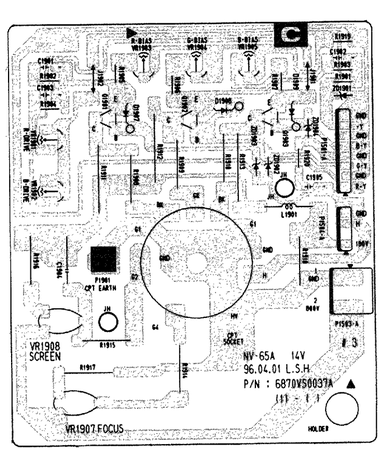
① 2.8Vp-p 1KHZ
② 2Vp-p
③ 220mVp-p
④ 28Vp-p 15.75KHZ
⑤ 1.7Vp-p
⑥ 5Vp-p 15.75KHZ
⑦ 5Vp-p 60HZ
⑧ 0.2Vp-p
⑨ 1.4Vp-p
⑩ 4.1Vp-p
⑪ 3.2Vp-p
⑫ 4.0Vp-p
⑬ 7Vp-p

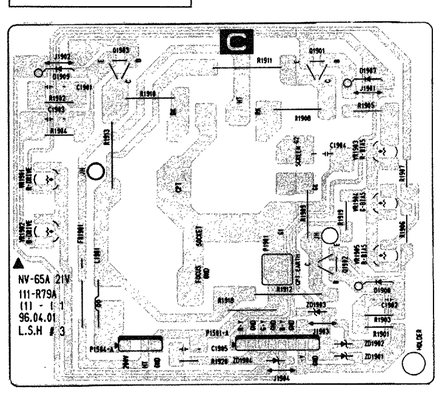
D BOARD

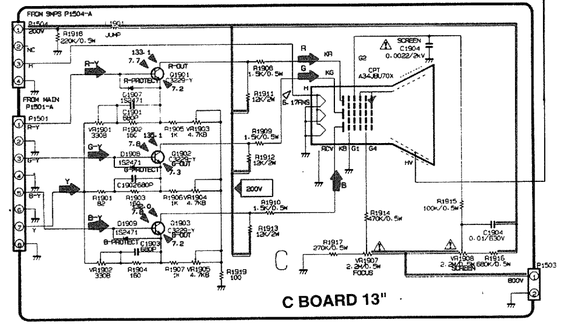


C BOARD

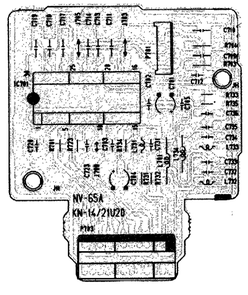


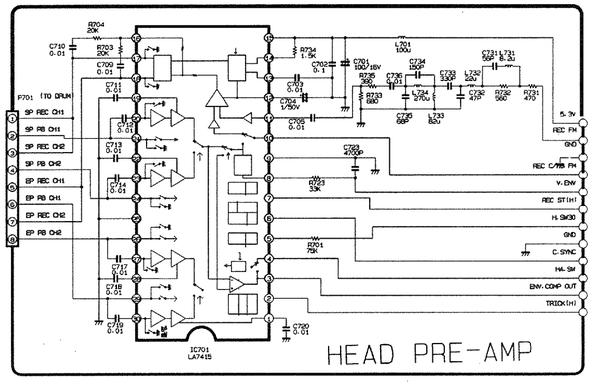






RP BOARD





NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

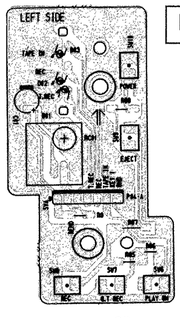
CAUTION
Four parts which are marked with ◢ on the schematic diagram are replacement parts in the "HOLD-DOWN CHECK"
IC1501, ZD1402, T1402, DY

Part Replaced(⚠)	Location
C1413, C1428, C1825, C1830, D1403, D/G COIL, F1802, F1803, FR1423, IC1802, IC1803, IC1804, P1401, P1801, R1401, R1417, R1418, R1427, R1428, R1839, RL1801, RL1802, T1401, T1801, ZD1305,ZD1306, Q1814, L1402	D BOARD
PICTURE TUBE	C BOARD

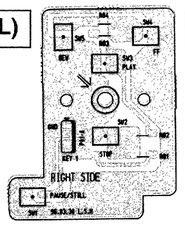
NOTE

1. Resistance is shown in ohm. K=1,000 M=1,000,000
2. Capacitors are shown in uF otherwise noted: P=uu
3. Unless otherwise listed, all inductor values more than 1 are expressed in uH, and the values less than 1 in H.
4. Voltages are measured DVM from point indicated to chassis ground, using color bar signal with all controls at normal.
5. Waveforms are measured with synchroscope from point indicated to chassis ground, using color bar signal with all controls at normal.
6. May choose anyone, since listed following semiconductors have same characteristics.

MF BOARD (L)

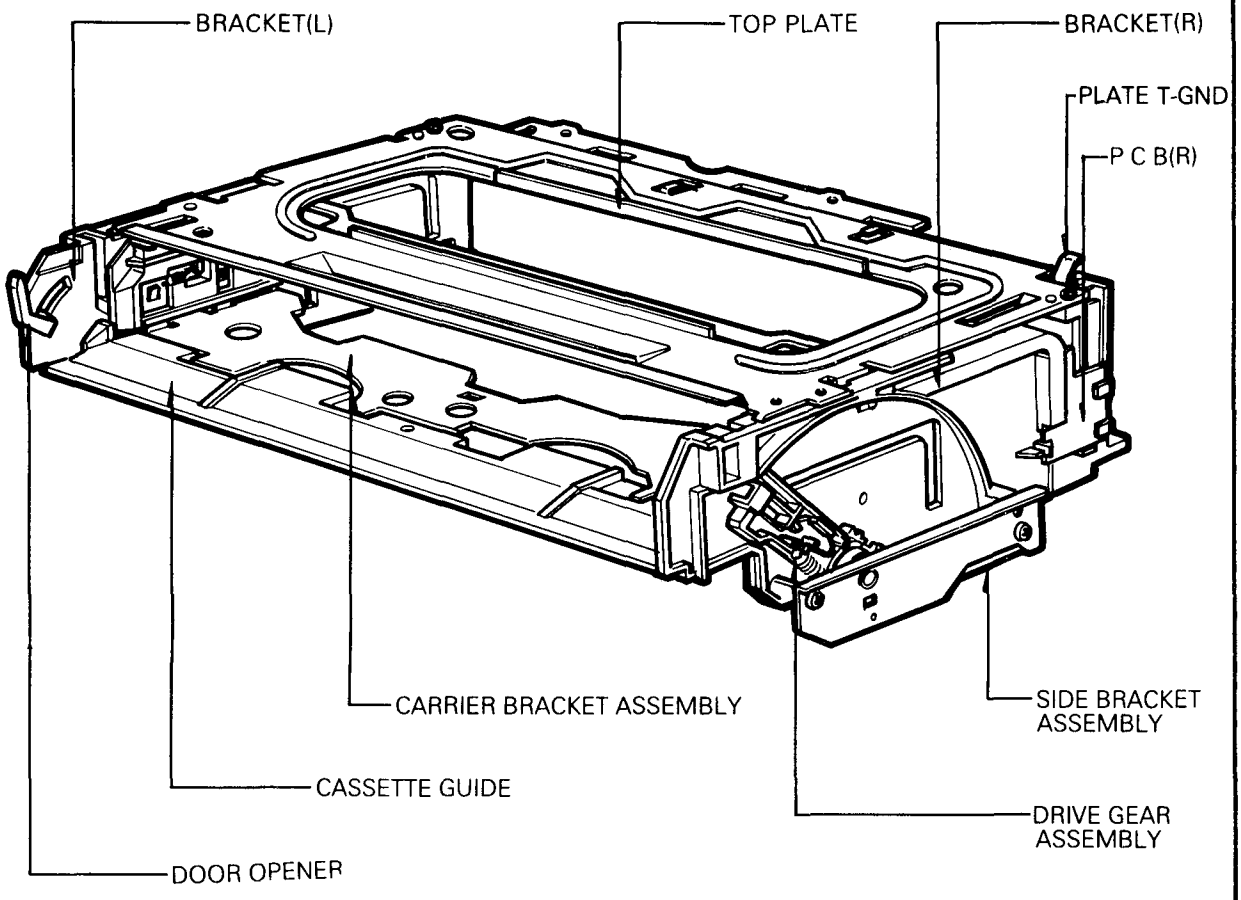


MF BOARD (R)



SECTION 9
MECHANISM DISASSEMBLY

9-1. FRONT LOADING MECHANISM



Front Loading Mechanism Parts Location

1. Component list below will be discribed as if the top and bottom covers and the front panel have already been removed.
2 P.C.B Assembly
3. Top Plate
4. Carrier Bracket Assembly
5 Cassette Guide
6 Side Bracket Assembly
7 Bracket(L), (R)
8. Door Opener
9 Drive Gear Assembly

1. Front Loading Mechanism Assembly (Fig. A-1-1)

1) Remove the Top and Bottom Covers and the Front panel.
2) Unplug the connector
3) Remove two screws(A)
4) Lift up the Front Loading Mechanism in the direction of arrow(C)

*** NOTE**

1) When disassembling and reassembling

① Give special attention to removal and to reassemble, because two tabs(D) are engaged.

② Make sure that Bosses of Bracket(L),(R) are properly engaged in the holes of the chassis.

③ To reassemble Front Loading Mechanism, the Drive Gear Assembly should be turned in a counterclockwise as shown in Fig A-1-2 so that the Rack Gear N.D of Front Loading Mechanism Assembly is meshed into Rack Gear F L of Deck Mechanism Assembly correctly as shown in Fig A-1-1 (B)

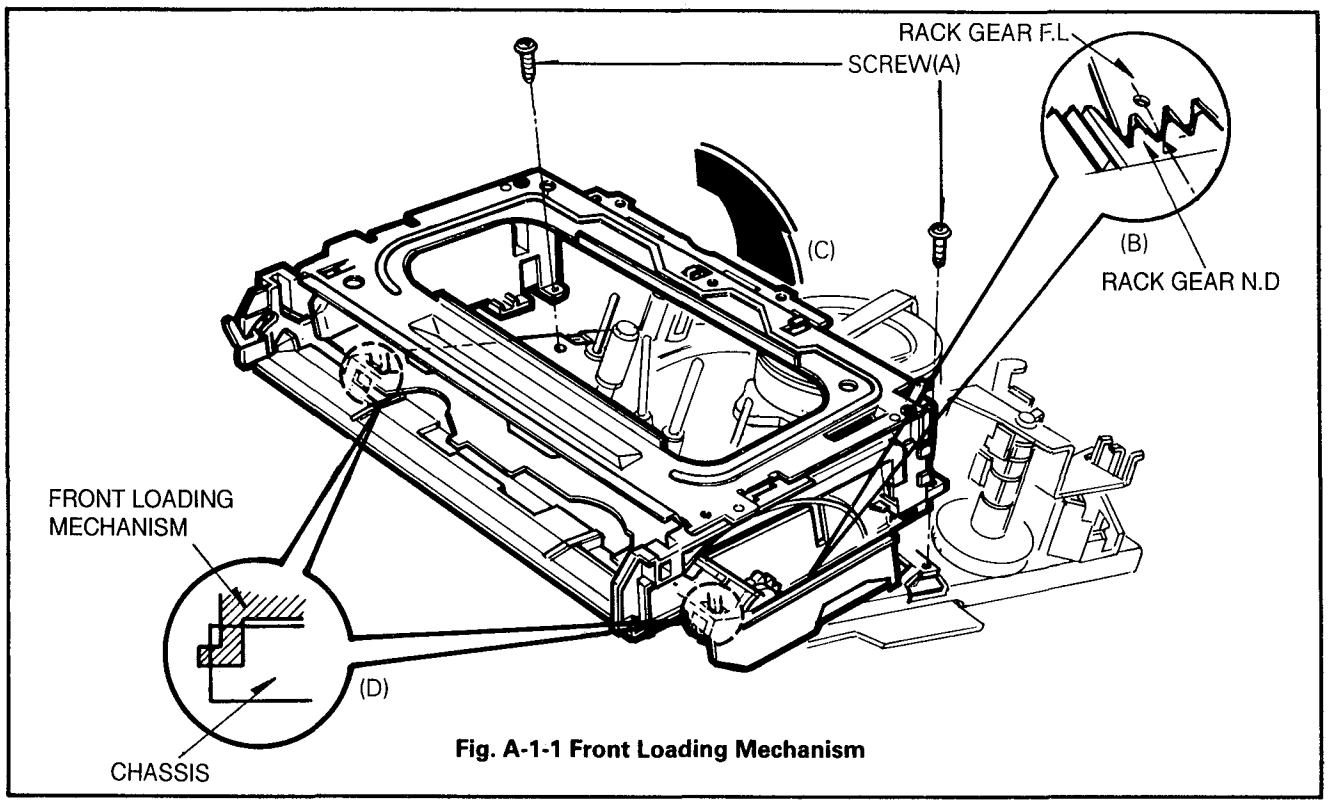


Fig. A-1-1 Front Loading Mechanism

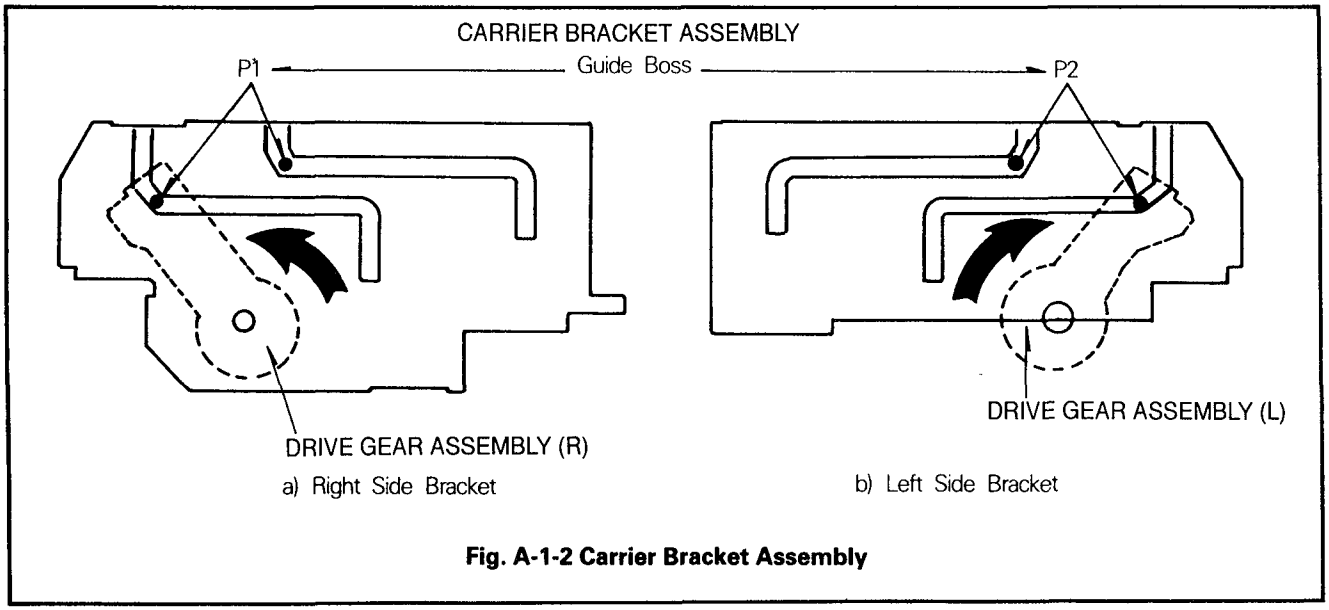


Fig. A-1-2 Carrier Bracket Assembly

2. PCB(Printed Circuit Board) Assembly

2-1. P.C.B Assembly(R)(Fig. A-2)

1) Remove the PCB Assembly(R) by pushing three Hooks (A) outward
2) Release the Lead wire from stoppers

2-2. PCB Assembly(L).(Fig. A-2)

1) Remove the PCB Assembly(L) by pushing the Hook(B) outward
2) Release the Lead Wire from stoppers

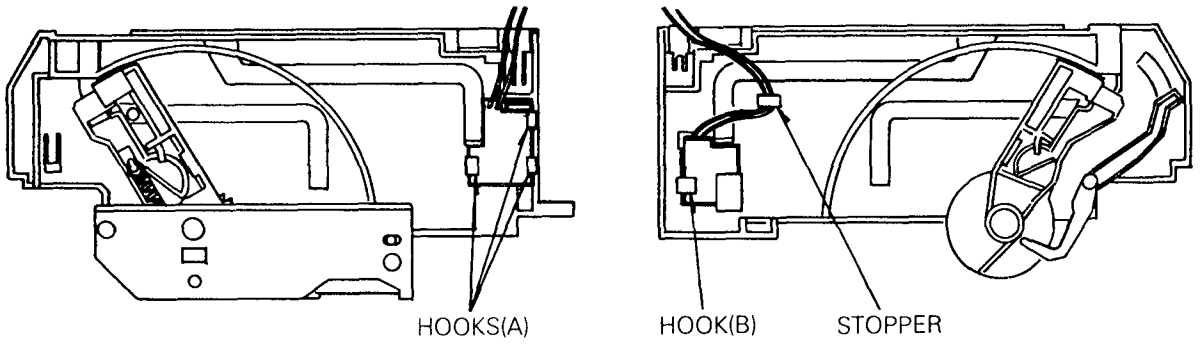


Fig. A-2 PCB Assembly

3. Top Plate(Fig. A-3)

1) Remove two screws(A)
2) Push the upper part of Top plate Ground and then lift up the Top Plate in the direction of arrow(B).

*** NOTE**

1) When reassembling, be certain that the tabs(C) of Top Plate is in both Bracket(L),(R)

① Then align the guide holes(D) of Top Plate with Bosses of side Bracket(L),(R)

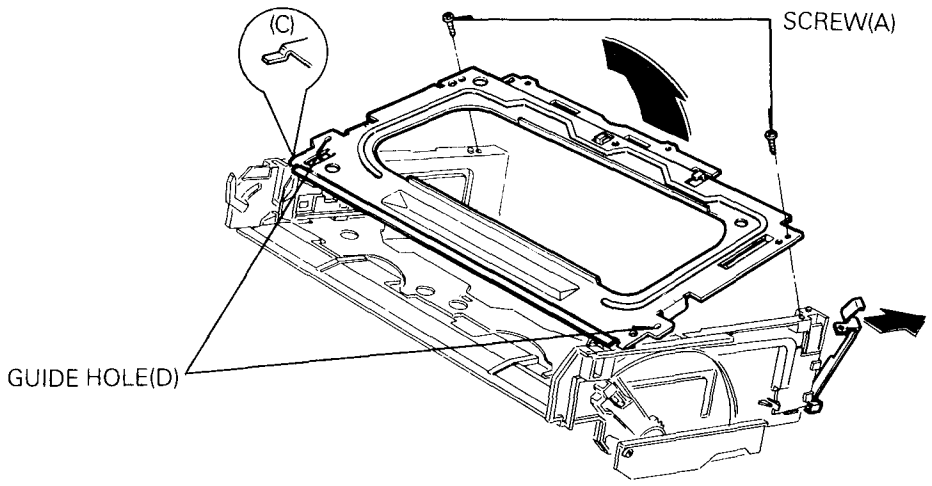


Fig. A-3 Top Plate

4. Carrier Bracket Assembly

4-1. Carrier Bracket Assembly(Fig. A-4-1)

1) Remove the Carrier Bracket Assembly by moving it in the direction of arrow(C)

*** NOTE**

1) When reassembling, be sure that parts(A) of Carrier Bracket Assembly are seated in parts(B) of Bracket(L),(R)

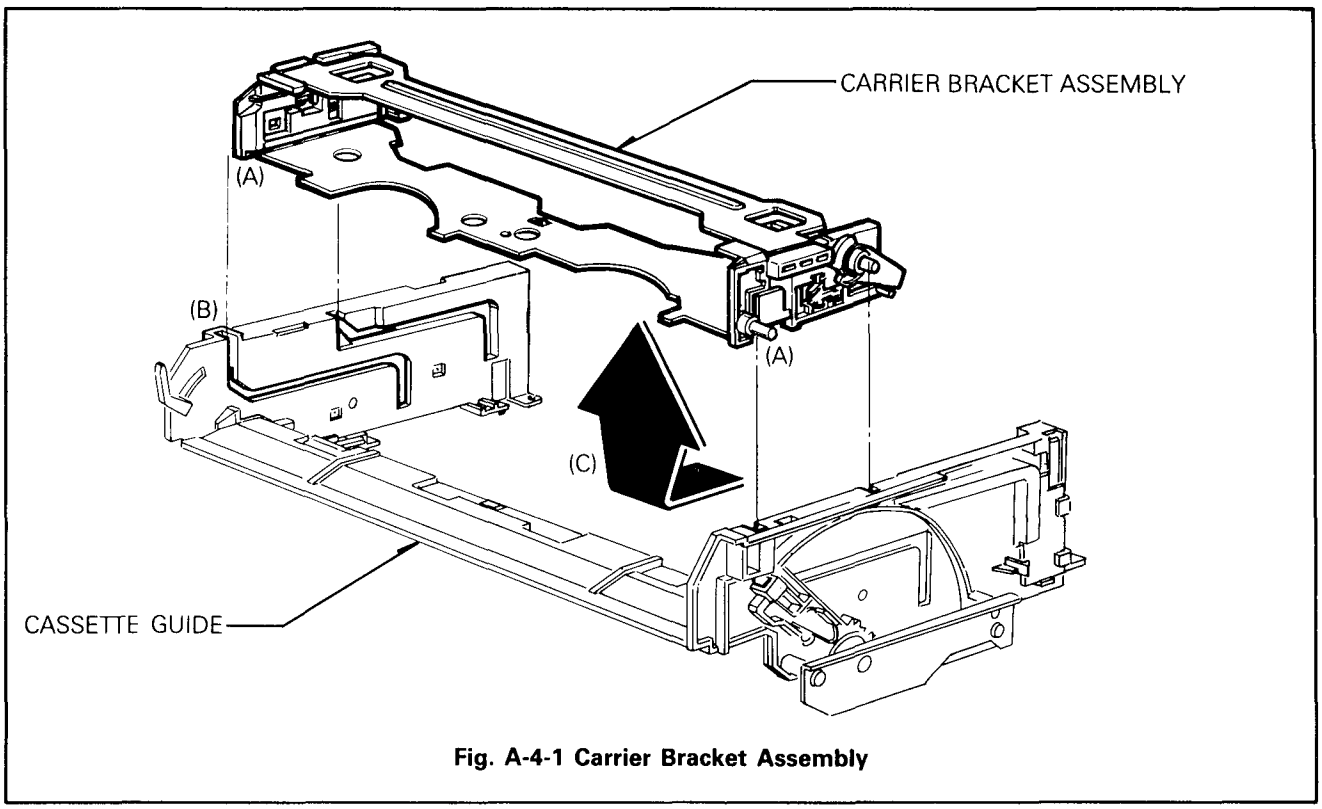


Fig. A-4-1 Carrier Bracket Assembly

4-2. Cassette Opener(Fig. A-4-2)

1) Release the spring O C from the Hook(A) and then release it from Hook(C) of cassette opener
2) Remove the cassette opener by releasing the Hook(B) from the Holder(R)

4-3. Rid Opener(Fig. A-4-2)

1) Remove the rid opener by pushing it outward

*** NOTE**

1) When reassembling, seat the upper part of the rid opener in the grooved of Holder(R) and push it inward.

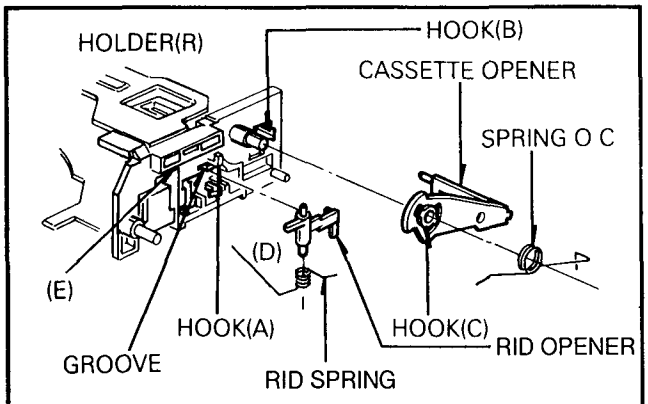


Fig. A-4-2 Cassette Door Opener/Rid Opener

4-4. Detect Lever and Detect Spring

1) Remove the spring detect
2) Lower the side(A) of Detect Lever and then remove the Detect Lever by pushing it outward

*** NOTE**

1) When reassembling, make sure that the part(C) of Detect Lever set in the part(B) of Holder(R)

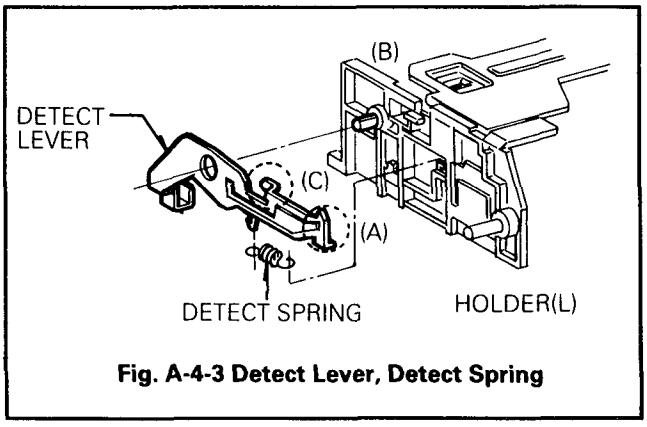


Fig. A-4-3 Detect Lever, Detect Spring

4-5. Support Bracket Assembly(Fig. A-4-4)

1) Take the Support Bracket out by releasing hooks(A),(B)

*** NOTE**

1) When disassembling and reassembling, be careful because heavy force can damage the hooks

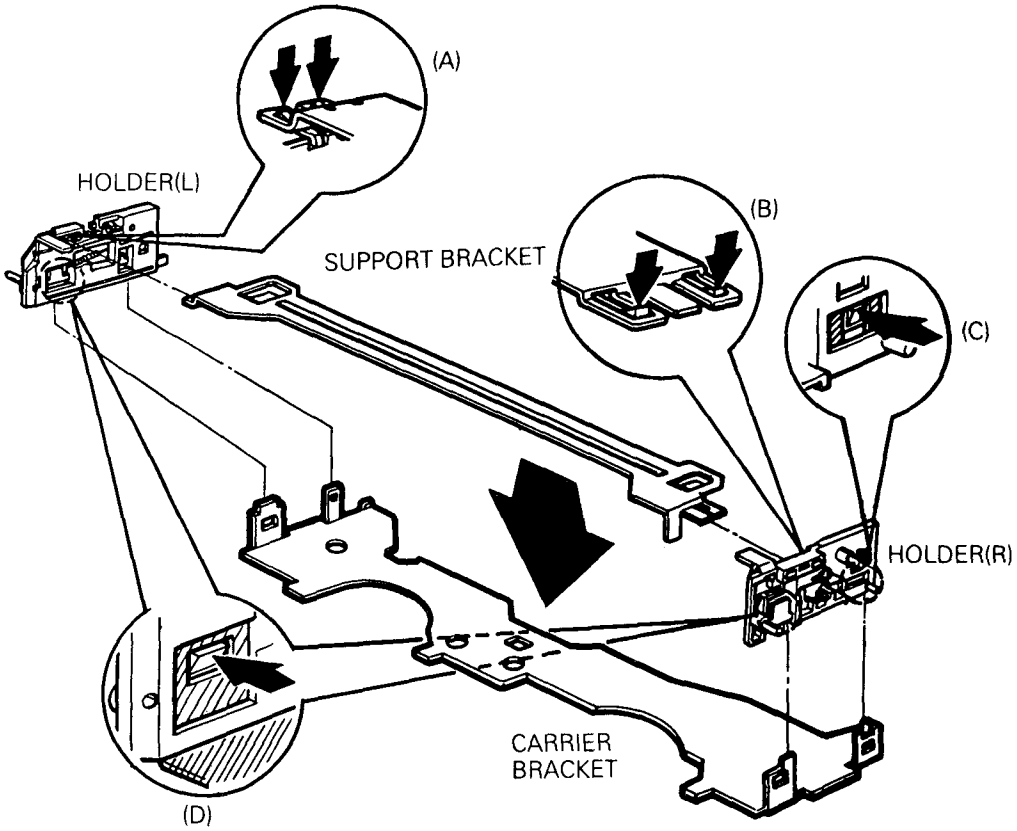


Fig. A-4-4 Support Bracket/Carrier Bracket

4-6. Carrier Bracket Assembly(Fig. A-4-4)

1) Remove the Carrier Bracket by releasing hooks(C),(D)

5. Cassette Guide(Fig. A-5)

1) Remove the Switch Spring with the Front Loading Mechanism Assembly turned over
2) Push two hooks(B) outward
3) Remove the Cassette Guide by pushing two hooks(A). outward(if one is removed, the other will be easy to remove)

*** NOTE**

1) When reassembling

① Seat projections(E) of Cassette Guide in holes of Bracket Assembly(L),(R) and then engage the Hook(A)

② After finishing previous step, fix the Cassette Guide to the Bracket Assembly(L),(R) by pushing two hooks(B) inward

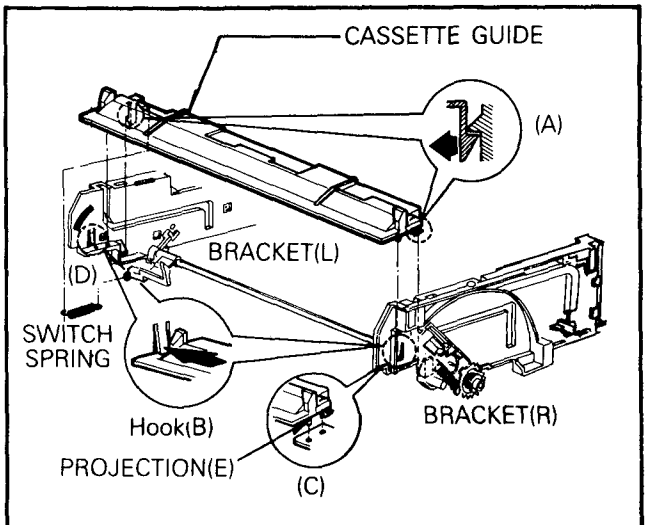


Fig. A-5 Cassette Guide

6. Bracket Assembly Side (Fig. A-6-1)

1) Remove two screws(A) and then remove the Side Bracket Assembly and the Rack Gear N D

*** NOTE**

1) When reassembling

① Turn the Drive Gear Assembly in the direction of arrow (C)

② Reassemble the Rack Gear N D to the Side Bracket Assembly, as shown in Fig A-6-2, and then reassemble it to the Bracket Assembly(L), This time the Assembling Figure should be the same as(B) at the rectangular hole of Bracket Side

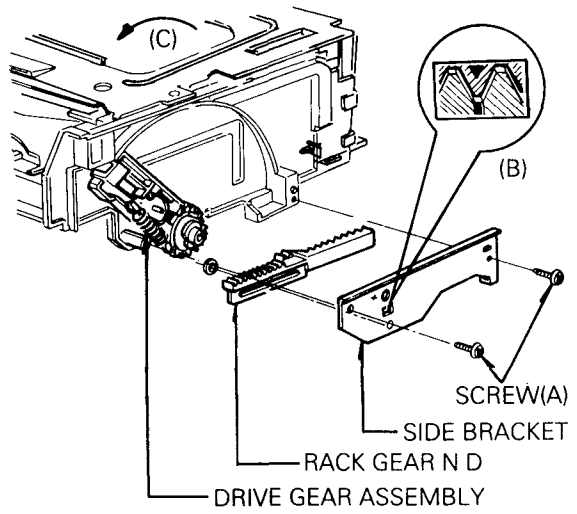


Fig. A-6-1 Side Bracket Assembly

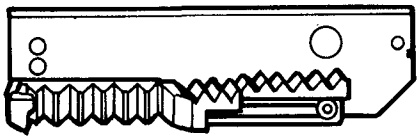


Fig. A-6-2

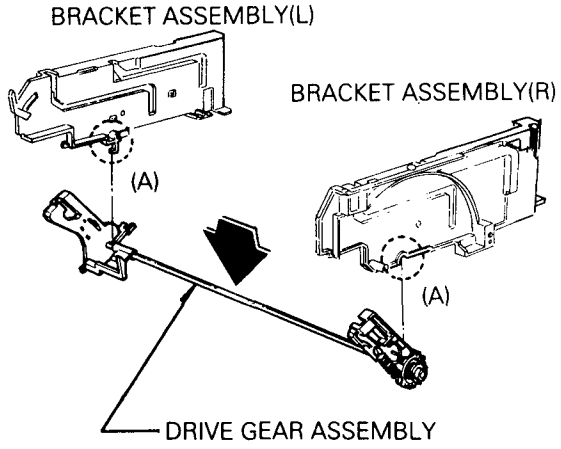


Fig. A-7 Bracket Assembly(L),(R)

7. Bracket Assembly(L),(R)(Fig. A-7)

1) Seperate the Bracket Assembly(L),(R) from the Gear Assembly Drive

*** NOTE**

1) When reassembling, seat the shaft in the part(A) of Bracket Assembly(L),(R)

8. Door Opener(Fig. A-8)

1) Remove the Door Opener by pushing Hook(A) outward

*** NOTE**

1) When reassembling, seat the part(B) of Door Opener in the hole( ) of Bracket(L)

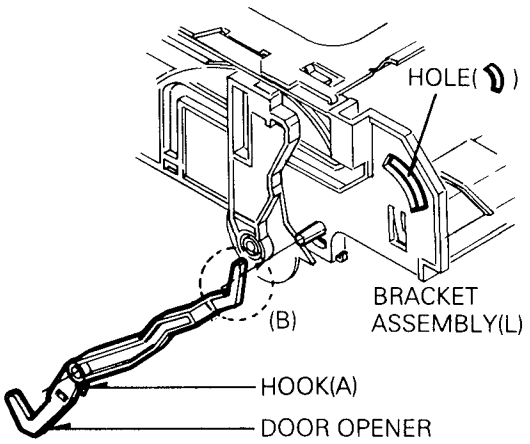


Fig. A-8 Door Opener

9. Drive Gear Assembly

9-1. Drive Gear Assembly(Fig. A-9-1)

1) Remove the Drive Gear Assembly from the Bracket Assembly(L),(R)

9-2. Cushion Spring(Fig. A-9-1)

1) Remove the cushion spring from the Gear R

9-3. Cap-D(Fig. A-9-1)

1) Remove the Cap-D by lifting it up

9-4. Spring C.C(Fig. A-9-1)

1) Remove the Spring C C from the Gear R

9-5. Gear C(Fig. A-9-1)

1) Remove the Gear C by lifting up when the projection of Gear C is aligned with the hole of Gear R while rotating the Gear C in the counterclockwise direction.

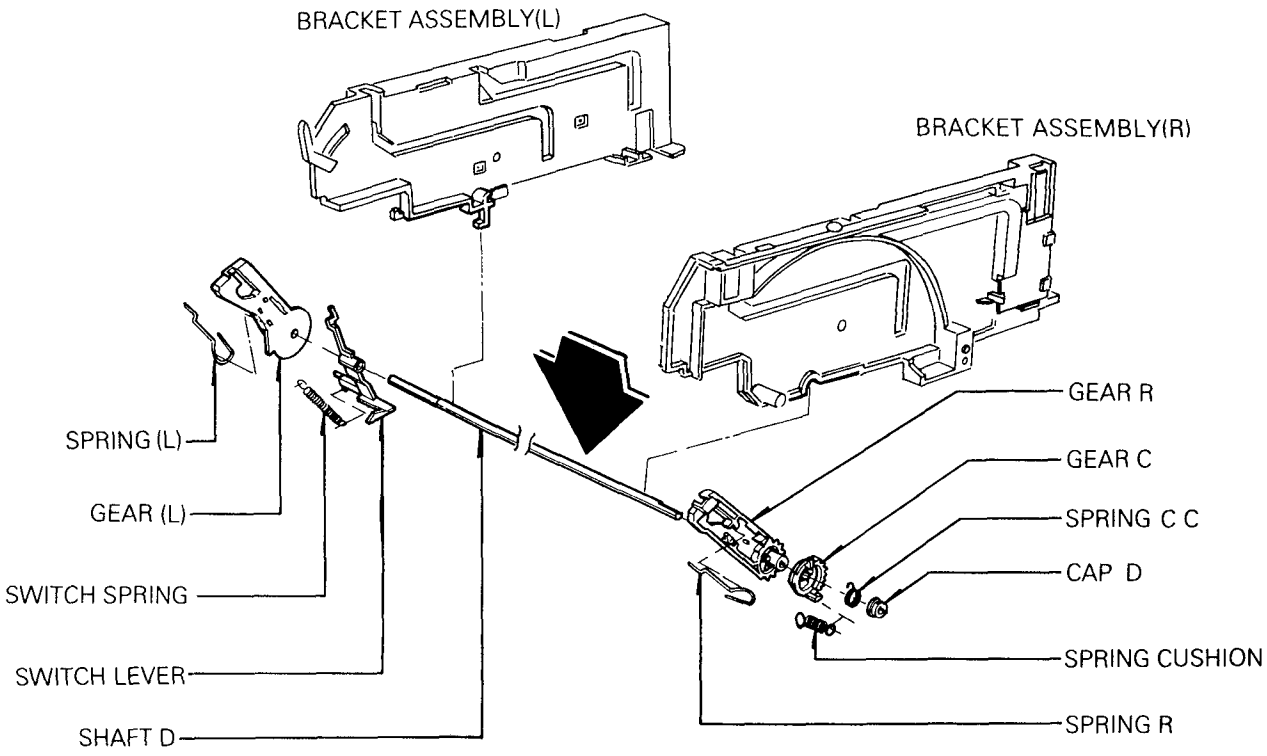


Fig. A-9-1 Drive Gear Assembly

*** NOTE**

1) When reassembling, seat the projections of Gear R in the holes of Gear C when the projection of Gear R is aligned with the hole of Gear C and then keep the Gear C turned in the clockwise direction

9-6. Gear R(Fig. A-9-1)

1) Lift up the Gear R from the Shaft

9-7. Spring R(Fig. A-9-2)

1) Remove the Spring R by releasing Hooks

*** NOTE**

1) When reassembling, be certain Spring R in the part(A) of Gear R

9-8. Gear L.(Fig. A-9-1)

1) Remove the Gear L from the shaft

9-9. Spring L (Fig. A-9-2)

1) Remove the Spring L by releasing Hooks from the Gear L

*** NOTE:** (Refer to the Spring R Section)

9-10. Switch Lever(Fig. A-9-1)

1) Remove the Switch Lever from the shaft

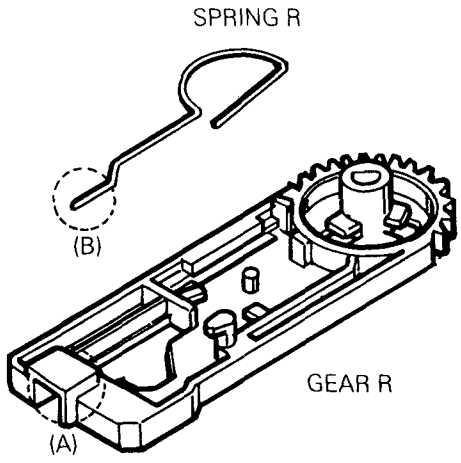
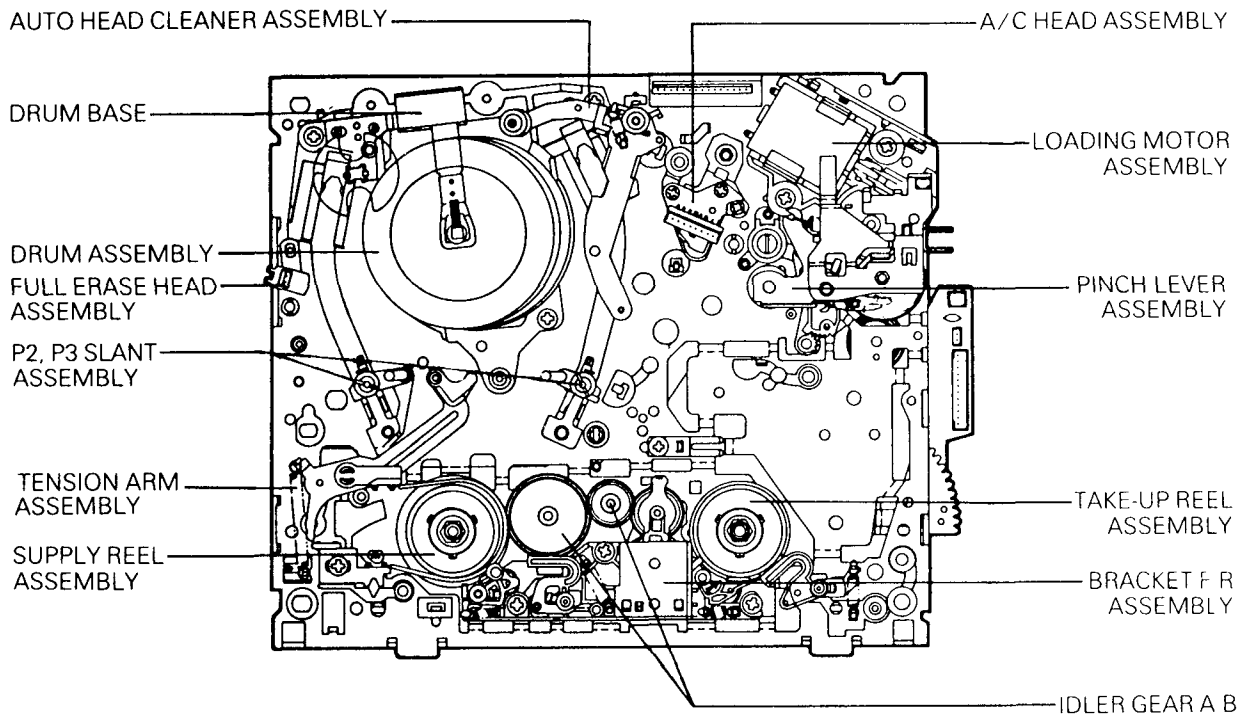


Fig. A-9-2 Spring R

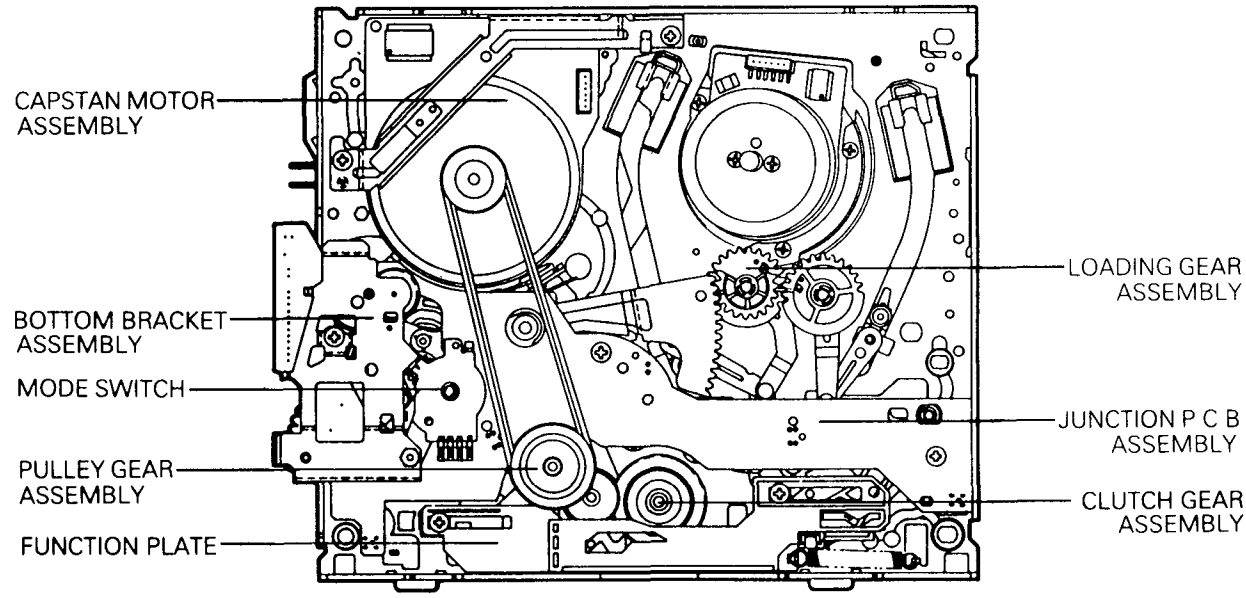
9-2. DECK MECHANISM

• Deck Mechanism Parts Location

Top Side



Bottom Side



1. Auto Head Cleaner Assembly (Fig. B-1) (Optional Item)

1) Remove the Cleaner Arm Assembly (Auto Head Cleaner Assembly) by pushing the Locking Tab (B) outward
2) Remove the Cleaner Upper Spring and then remove the Cleaner Upper Arm Sub Assembly
3) Remove the Cleaner Spring

*** NOTE**

1) When reassembling, do not touch the Video Head Tip with fingers or tools

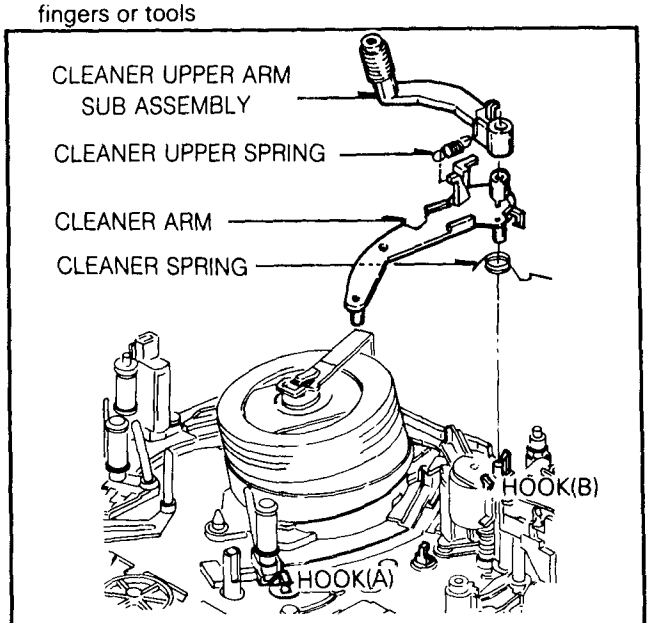


Fig. B-1 Auto Head Cleaner Assembly

2. Drum Assembly and Drum Base(Fig. B-2)

1) Remove the Auto Head Cleaner Assembly (Option)
2) Unplug the connector with the Deck Mechanism Assembly turned over
3) Loosen the screw(A) and then lift up the Drum Brush
4) Remove two screws(B) and then lift up the Drum Assembly and Drum Base from the Deck Mechanism Assembly
5) Separate the Drum Assembly from the Drum Base by Loosening three screws(C) on the back of Drum Base

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head tip with fingers or tools (Give special attention to disassembling and reassembling of Auto Head Cleaner Assembly)
② After reinstalling the Drum Brush, the Drum Brush should be aligned with the center of vertical axis of Drum Assembly
③ After completing the reassembly, adjust the transportation system and the Servo P G

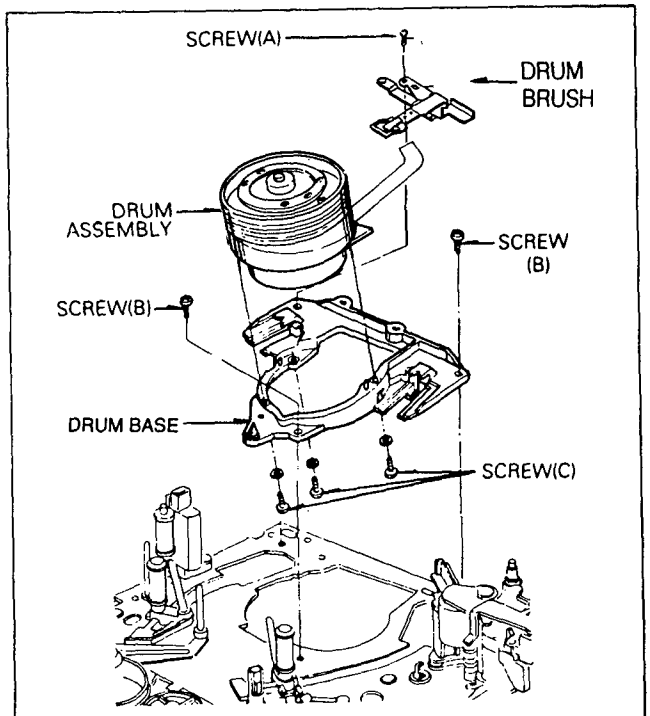


Fig. B-2 Drum Assembly/Drum Base

3. Drum Assembly

3-1. Drum Sub and Motor Assembly (Fig. B-3-1) : New Type (No two screws and P.C.B on the Drum)

1) Remove the Drum Base from the Deck Mechanism Assembly
2) Separate the Drum Assembly from the Drum Base
3) Remove two screws(A) and then remove the rotor
4) Remove three screws(B) and then remove the stator

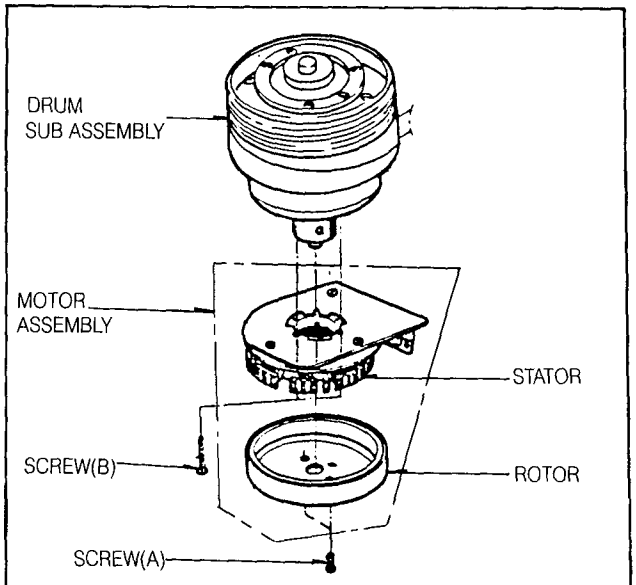


Fig. B-3-1 Drum Sub and Motor Assembly

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools.

3-2. Upper and Lower Drum Assembly (Fig. B-3-2)
: Old Type (There are two screws and P.C.B on the Drum)

1) Remove the Drum Assembly and Drum Base from the Deck Mechanism Assembly
2) Separate the Drum Assembly from the Drum Base.
3) Remove two screws(A)
4) Remove the P C B
5) Separate the upper Drum Assembly from the Lower Drum Assembly.

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools
② Make sure that the color(white) marked on the P.C B of the upper Drum should coincide with the color(Green) marked on the Flange Assembly

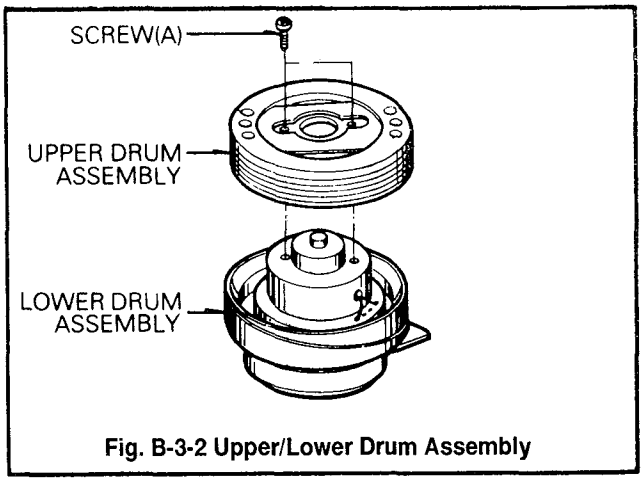


Fig. B-3-2 Upper/Lower Drum Assembly

4. A/C(Audio/Control) Head Assembly (Fig.B-4)

1) Unplug the connector
2) Remove the Nut(A), and then lift up the A/C Head Assembly
3) Remove the Azimuth Adjusting Screw
4) Remove two screws(B),(D) and then separate the A/C Head Assembly from the Base A/C Head Assembly

*** NOTE**

1) When disassembling
① First of all, release the spring A/C
② Do not touch the A/C Head Tip with fingers or tools
③ After reinstalling the Audio Control Head Assembly, adjust the Tilt, Azimuth and Height of A/C Head

5. Pinch Lever Assembly(Fig. B-5)

1) Remove one Nut, and then remove the Dew Bracket
2) Lift up Pinch Lever Assembly.
3) Remove the Pinch Spring, and remove the Pinch Lever
4) Remove the Stopper Spring and remove the Pinch Stopper by lifting it up when the Hook of Pinch Stopper is aligned with the hole of Pinch Arm while rotating the Pinch Stopper in the counterclockwise direction.
5) Remove the Pinch Cap, and then remove the Pinch Roller Assembly

*** NOTE**

1) When disassembling and reassembling
① Be careful not to get any foreign substance on the Roller.
② When disassembling the Pinch Cap, be careful not to damage the Pinch Arm

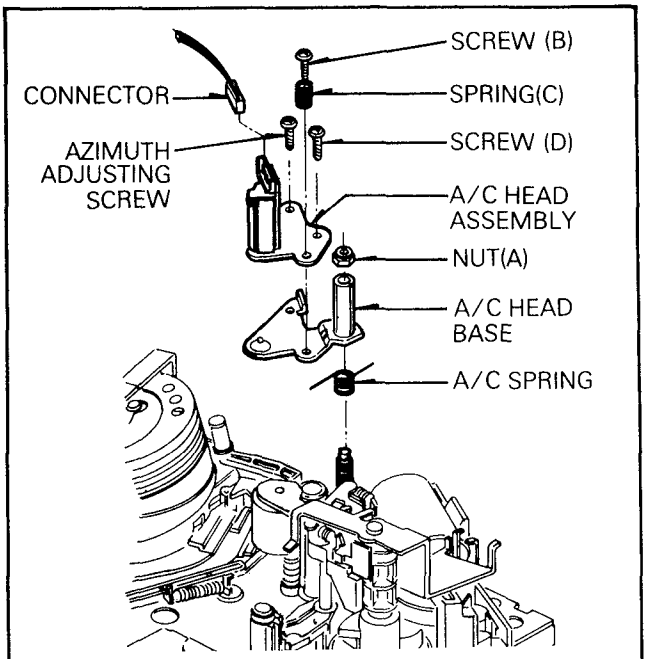


Fig. B-4 A/C Head Assembly

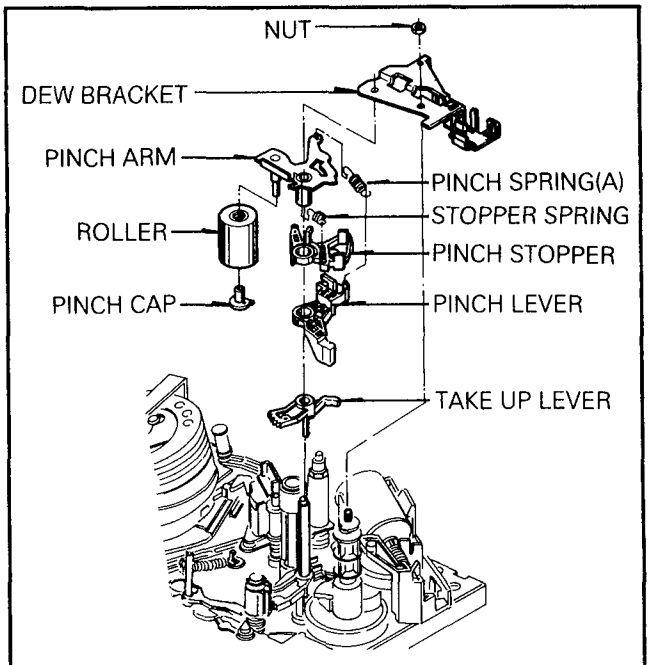


Fig. B-5 Pinch Lever Assembly

6. Loading Motor Assembly(Fig. B-6-1, B-6-2)

1) Remove the Dew Bracket
2) Unplug the connector from the Junction P C B Assembly
3) Remove two screws(A)
4) Remove the worm wheel by pushing it down
5) Remove the Loading Motor Assembly by pushing(C) and (D) outward
6) Remove the worm Gear Assembly from the Loading Motor Assembly by pushing it

*** NOTE**

1) When reassembling

① Make sure that the worm assembly is seated in the axis of Loading Motor

② Two grooves(G) of Loading Motor should be turned up and two projections(F) of Bracket Assembly should be seated in each at the two holes(E)(Fig B-6-1)

③ Take notice of the polarity of the Loading Motor

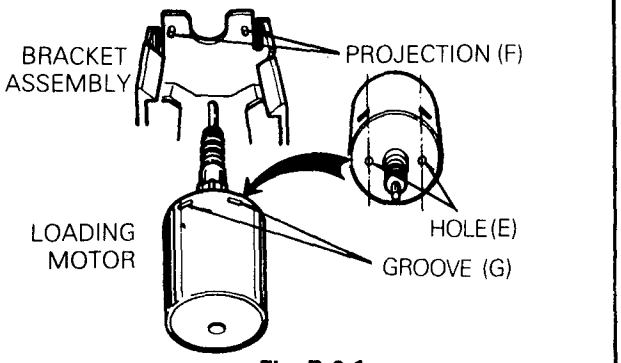


Fig. B-6-1

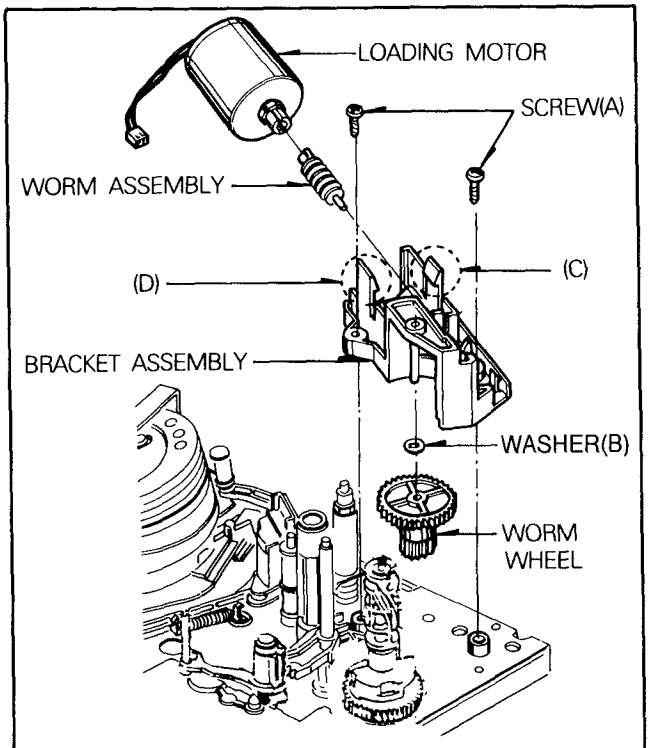


Fig. B-6-2 Loading Motor Assembly

7. Take Up Lever(Fig. B-7)

1) Remove the Loading Motor Assembly
2) Remove the Dew Bracket(Fig B-5).
3) Remove the Pinch Lever Assembly(Fig. B-5).
4) Keep the Pinch Gear turned in the clockwise direction (180°).
5) Remove the Take-Up Lever by pushing the hook(A) outward.

*** NOTE**

1) When disassembling and reassembling

① When disassembling the Take-Up Lever, be careful not to break the Hook(A)

② When reassemble the Take-Up Lever,align the appendant Gear of Lever Take-Up with the appendant Gear of Take-up Arm

③ Reassemble the Take-Up Lever completely by hooking (A)

④ Be sure to replace together Take-Up Lever and Pinch Gear.

⑤ Be sure to assemble Pinch Lever Assembly before operating.

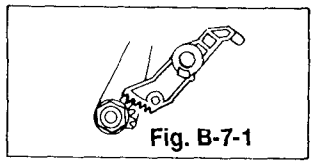


Fig. B-7-1

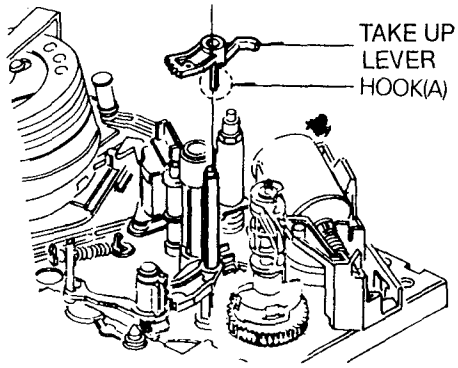


Fig. B-7. Take-Up Lever

8. Take Up Arm Assembly(Fig. B-8)

1) Remove the Loading Motor Assembly.
2) Remove the Dew Bracket, Pinch Gear, and the Take-Up Lever.
3) Remove one Washer(A).
4) Remove the Take-Up Arm Assembly by lifting it up.
5) Remove the spring(B).

*** NOTE**

1) When reassembling

① Align the Gear of Take-Up Arm with the Gear of Take-Up Lever(Fig. B-7-1).

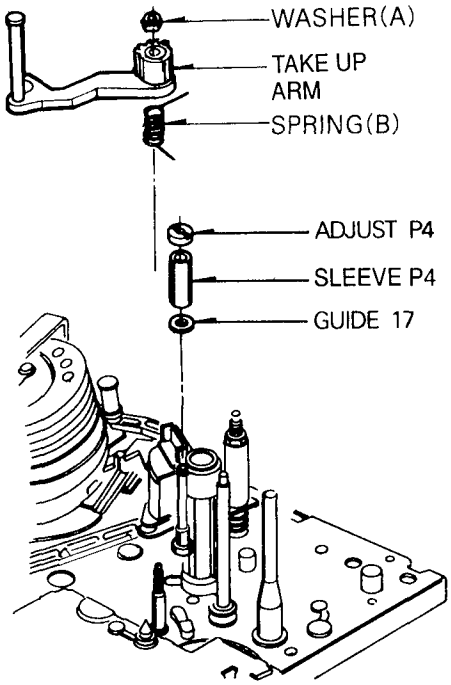


Fig. B-8 Take-Up Arm Assembly/P4

9. P4 Assembly(Fig. B-8)

1) Remove the Adjust P4
2) Remove the Sleeve P4.
3) Remove the Guide 17

10. Pinch Gear(Fig. B-10-1, B-10-2)

1) Remove the Loading Motor Assembly.
2) Remove one Nut(A) and then remove the Dew Bracket (Fig. B-5).
3) Remove the Pinch Lever Assembly by lifting it up(Fig. B-5)
4) Keep the Pinch Gear turned in the clockwise direction (180°).
5) Remove the Take-Up Lever by pushing the hook(A) outward(Fig. B-7).
6) Keep the Pinch Gear turned in the counterclockwise direction (180°).
7) Remove the Pinch Gear Assembly.

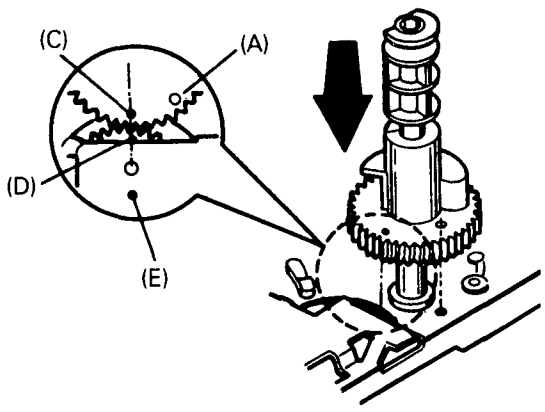


Fig. B-10-2 Pinch Gear

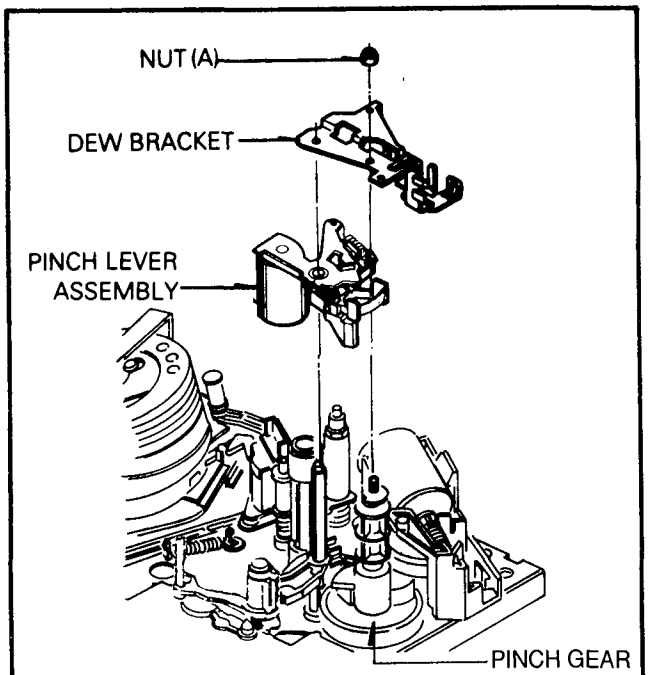


Fig. B-10-1 Pinch Gear Assembly

*** NOTE**

1) When reassembling, align the hole(A) of Pinch Gear with the hole of chassis, and the hole(C) of Pinch Gear with the groove(D) of the P C.Gear. Hole(E) of chassis should be aligned with the hole of P.C Gear.
2) Be sure to replace together Take-Up Lever and Pinch Gear.
3) Be sure to assemble Pinch Lever Assembly before operating.

11. FE(Full Erase) Head Assembly(Fig. B-11) (Optional Item)

1) Unplug the connector
2) Remove one screw(A), and then remove the FE Head

*** NOTE**

1) When disassembling and reassembling

① Do not touch the Video Head Tip with fingers or tools

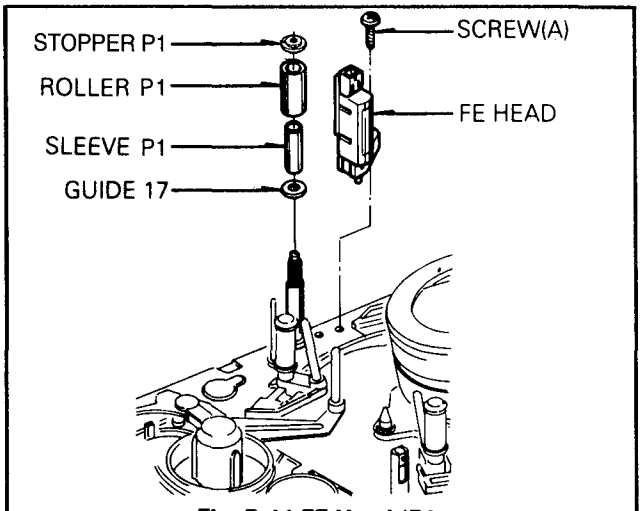


Fig. B-11 FE Head/P1

12. P1 Assembly(Fig. B-11)

1) Remove the Stopper P1.
2) Remove the Roller P1 .
3) Remove the Sleeve P1.
4) Remove the Guide 17.

13. Tension Arm Assembly(Fig. B-13)

1) Remove one screw(C)
2) Remove the Tension Spring
3) Remove the Tension Arm Assembly by pushing hooks outward with the Deck Mechanism Assembly turned over
4) Remove the Tension Band Assembly from the Tension Arm by pushing Hooks of Holder(A)

*** NOTE**

1) When disasembling and reassembling, give special attention to the disassembling and reassembling of Tension Arm Assembly, because the Tension Band is interposed between the Supply Reel and the Soft Brake.

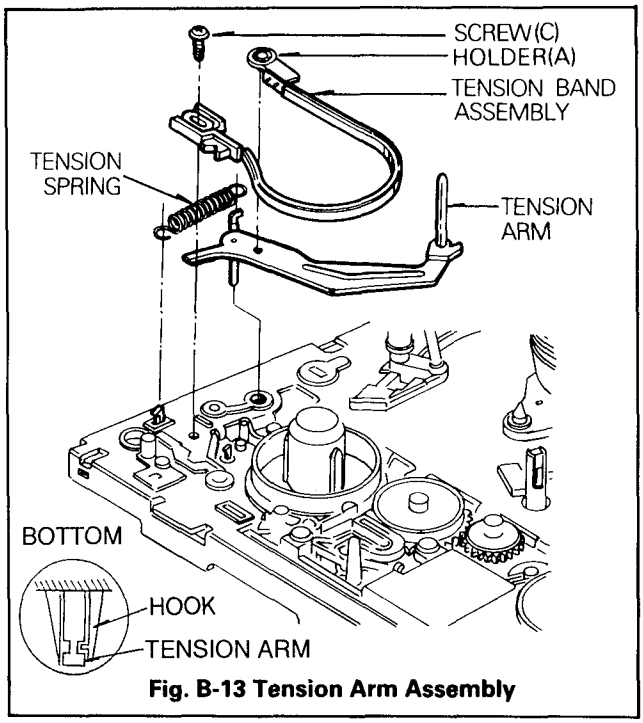


Fig. B-13 Tension Arm Assembly

14. Supply Soft/Supply Main/Take-Up Soft /Take-Up Main Brake Assembly

1) Supply Soft Brake(SSB)
   ① Remove the SSB Spring
   ② Remove the SSB.
2) Supply Main Brake(SMB)
   ① Remove the SMB Spring
   ② Remove the SMB.
3) Take Up Soft Brake(TSB)
   ① Remove the TSB Spring.
   ② Remove the TSB.
4) Take-Up Main Brake(TMB)
   ① Remove the TMB Spring
   ② Remove the TMB.

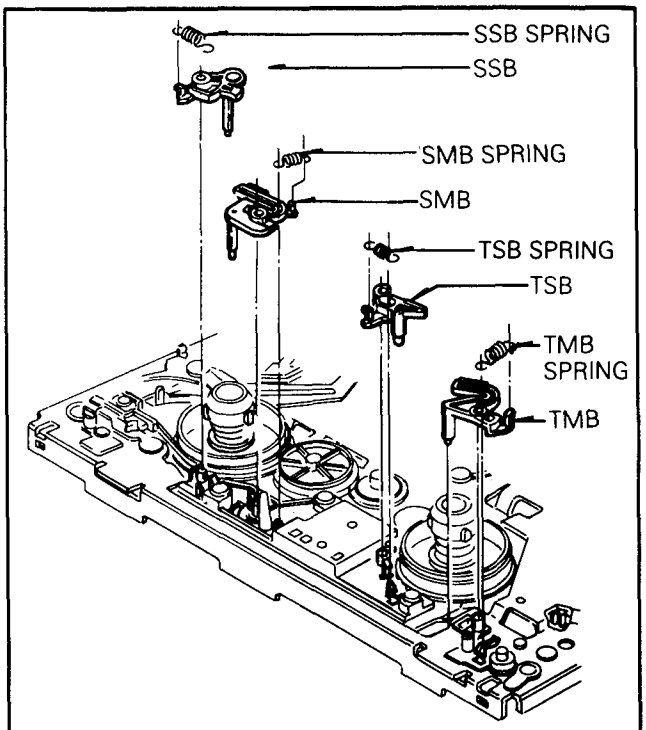


Fig. B-14 SMB/SSB/TMB/TSB

15. Bracket F/R(FF/Rewind) Assembly (Fig. B-15)

1) Remove the TMB
2) Remove the Washer(A), and then remove the Gear F.R.
3) Remove three screws, and then remove Bracket F/R Assembly from the Deck Mechanism Assembly
4) Remove the Washer(B), and spring Up/D, and then remove the Gear Up/D
5) Remove the shaft(C), and then remove the Arm F R, Lever F.R and Spring F.R.

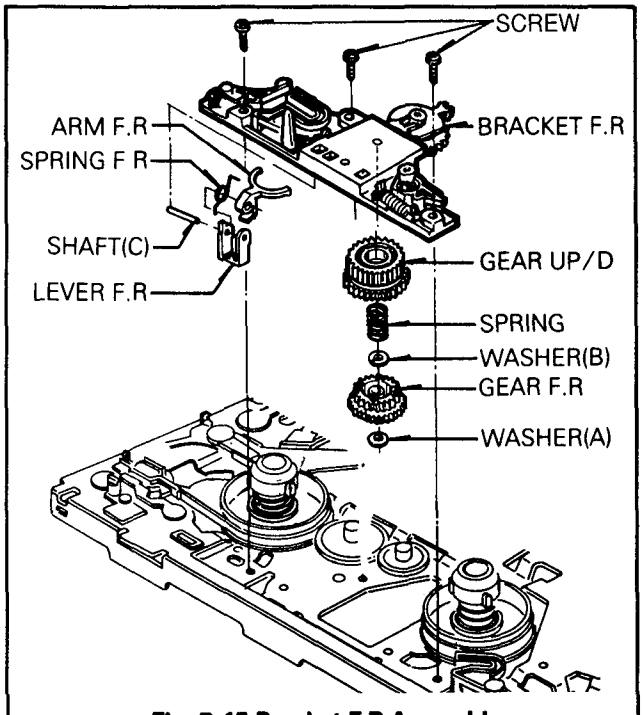


Fig. B-15 Bracket F.R Assembly

16. Supply Reel Assembly(Fig. B-16)

1) Remove the Tension Band Assembly
2) Remove the Bracket F/R
3) Lift up the Supply Reel Assembly from the Deck Mechanism Assembly.

17. Take Up Reel Assembly(Fig. B-16)

1) Remove the TMB(Fig B-14)
2) Lift up the Take-up Reel Assembly from the Deck Mechanism Assembly

*** NOTE**

1) When reassembling

① Make sure that the Supply and Take Up Reel are not exchanged.

② After reinstalling the Supply Reel Assembly, Adjust the Tension

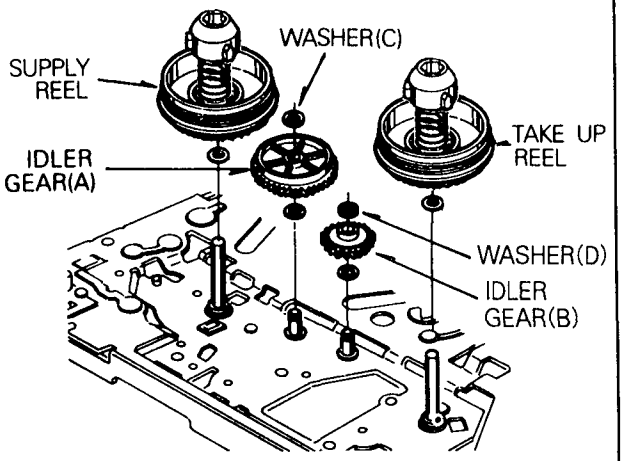


Fig. B-16 Supply Reel Assembly/Take-Up Reel Assembly

18. Idler Gear(A), (B)(Fig. B-16)

1) After removing the Supply Reel and supply Main Brake Assembly, remove the washer(C) and then remove the Idler Gear(A).
2) Remove the Washer(D) and remove the Idler Gear(B)

19. Pulley Gear Assembly(Fig. B-19)

1) Turn over the Deck Mechanism Assembly
2) Remove the Capstan Belt
3) Remove the Washer(A) and lift up the Pulley Gear.

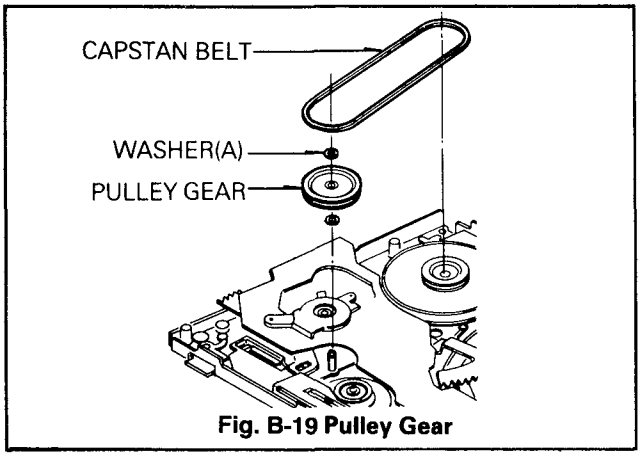


Fig. B-19 Pulley Gear

20. Bracket Bottom Assembly(Fig. B-20)

1) Remove one screw(A)
2) Remove one Hexagonal Nut, and then lift up the Bracket Bottom Assembly
3) Remove one Washer(C), and lift up the Ratchet Gear 1
4) Remove the washer(D), and then remove Ratchet Gear 3 from the Bracket Bottom.

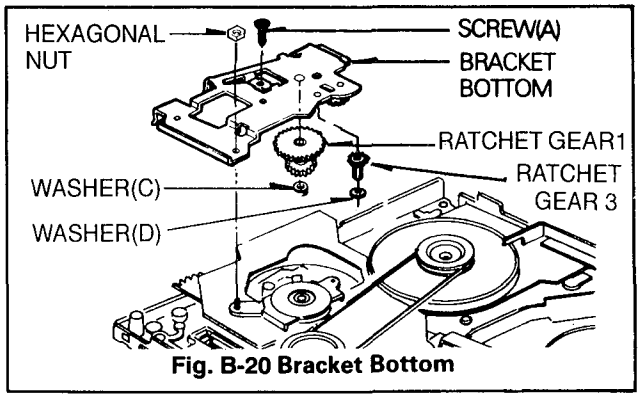


Fig. B-20 Bracket Bottom

21. Junction PCB(Printed Circuit Board) Assembly(Fig. B-21-1)

1) Remove the Bracket Bottom Assembly.
2) Remove two screws(A), (B) and then remove the Junction P.C.B Assembly
3) Remove the Mode Switch from the Junction P.C B Assembly
4) Remove the Reel Sensor, Sensor LEDS and each holder from the Junction P.C.B(Fig. B-21-2).

*** NOTE**

1) When reassembling the Mode Switch, the groove(V) and (U) of Mode Switch should be at their original place in the Eject Mode

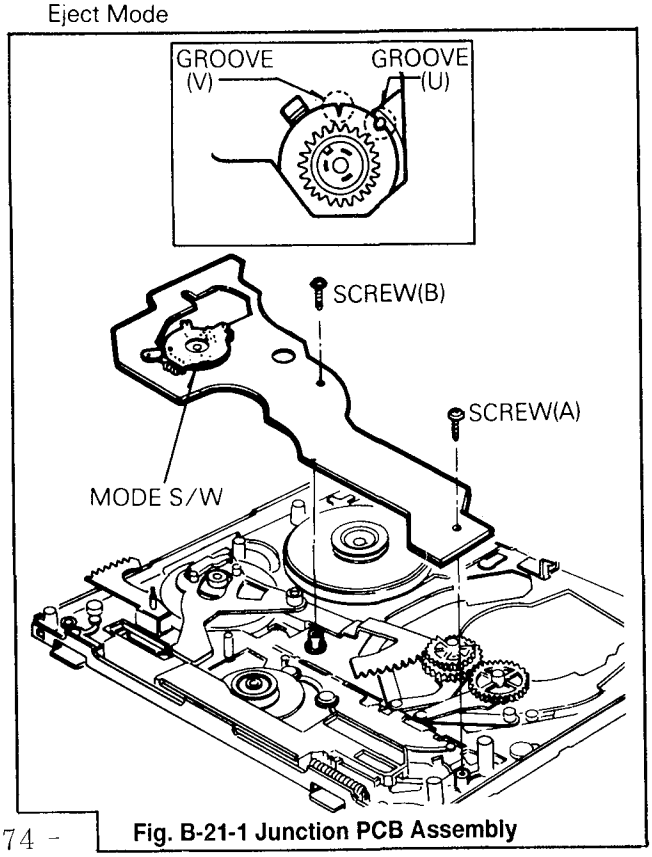


Fig. B-21-1 Junction PCB Assembly

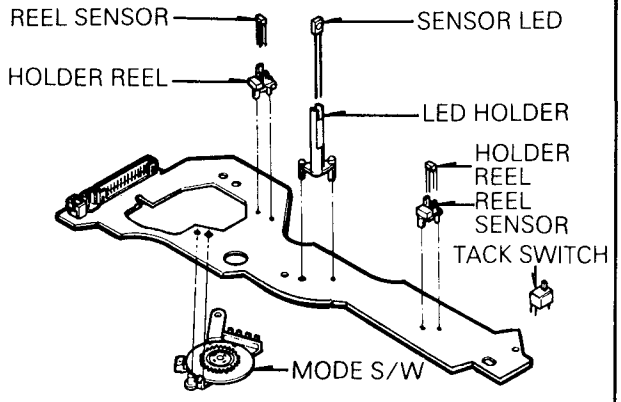


Fig. B-21-2 Mode S/W/Reel Sensor/Sensor Led

22. Capstan Motor and Brake Assembly (Fig. B-22-1)

1) Remove the Junction P C B Assembly
2) Hook the end of Capstan Brake Spring to the projection of Capstan Brake and then remove the Capstan Brake Assembly by lifting it up(Fig B-22-2)
3) Remove two Screws(A), and then remove the Bracket C-Guide
4) Remove the Connector
5) Remove three screws(B), and then remove the Capstan Motor Assembly from the Deck Mechanism Assembly

*** NOTE**

1) When disassembling and reassembling, hook end of the spring on the projection of Cap-Brake and remove it by lifting it up Reassemble it in the opposite manner

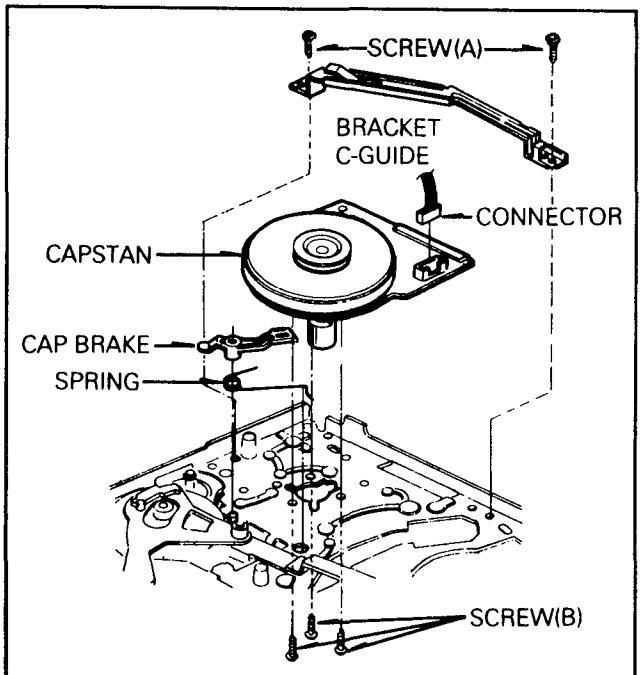


Fig. B-22-1 Capstan Motor Assembly

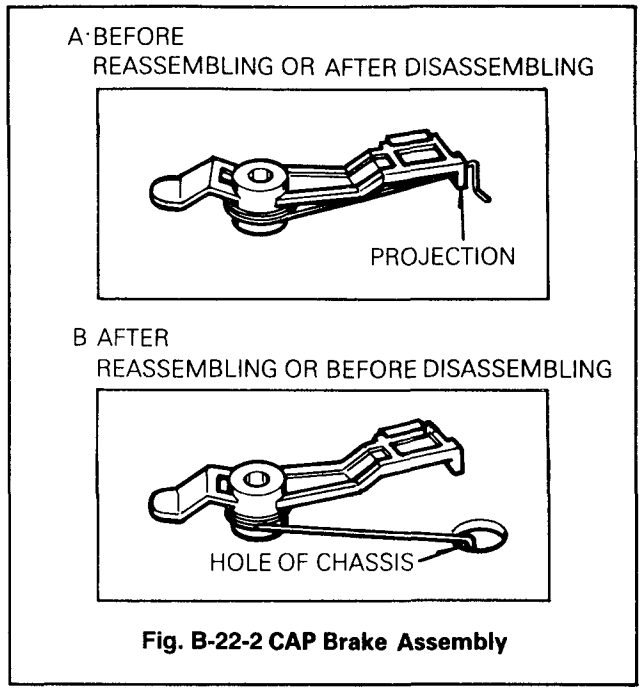


Fig. B-22-2 CAP Brake Assembly

23. Function Plate(Fig. B-23)

1) Remove two screws(B) in Eject Mode.
2) Remove the Function Plate Spring
3) Push the Function Plate in the direction of arrow(A) and then lift it up.

*** NOTE**

1) When reassembling,the groove of Lower part of Function Plate should be aligned with the shaft of Tension Lever Assembly (Fig B-29)

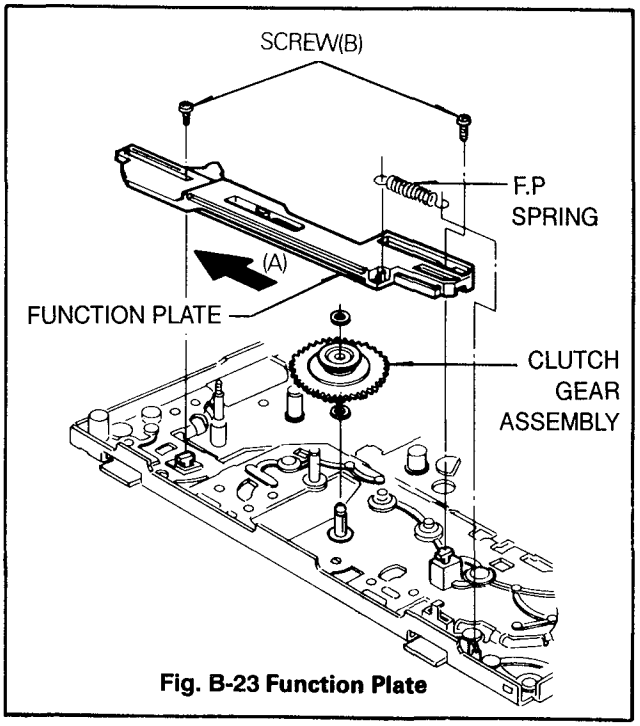


Fig. B-23 Function Plate

24. Ratchet Lever Assembly(Fig. B-24)

1) Remove the Function Plate
2) Remove the Junction P C B Assembly
3) Remove the Washer(A) and then remove the Ratchet Lever Assembly.
4) Remove the Ratchet Spring.
5) Remove the Ratchet Lever from the Ratchet 17 by lifting it up when the hook of it is aligned with the hole of Ratchet 17 while rotating it counterclockwise direction
6) Remove the Washer(B), and turn over the Ratchet 17 and then remove the F-Lever Pin, Spring F-Lever.

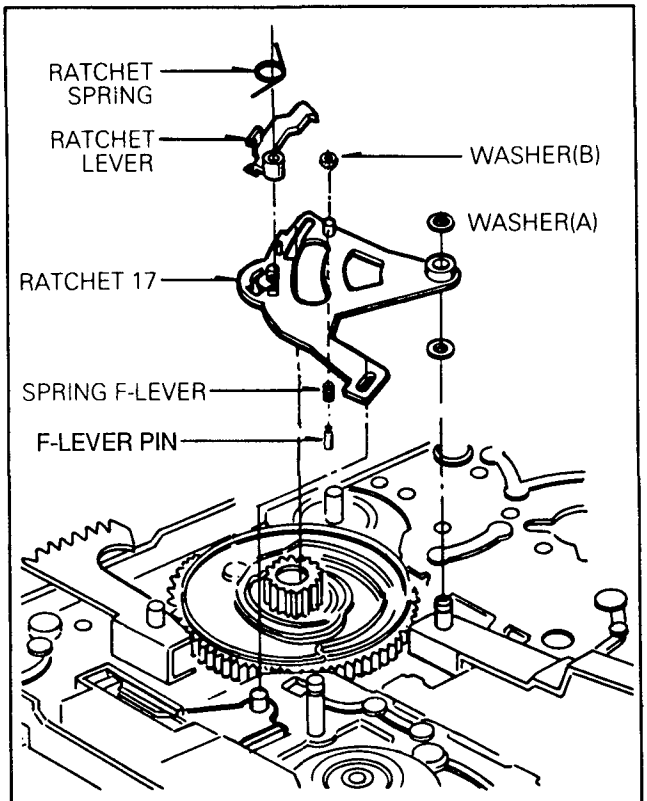


Fig. B-24 Ratchet Lever Assembly

25. Cam Gear/Rack Gear T/Rack Gear FL(Fig. B-25-2)

1) Remove the washer(A) and remove the Ratchet Lever Assembly (Fig B-25-1)
2) Remove the washer(B), and then remove the Cam Gear (Fig B-25-2)
3) Remove the Rack Gear F L (Fig B-25-3)
4) Remove the Washer(D).(Fig. B-25-3).
5) Remove the Rack Gear T.(Fig. B-25-3).

*** NOTE**

1) When reassembling

① Align the Projection of Rack Gear T with the hole of Loading Gear

② Drive the Rack Gear F.L in the direction of arrow(D).

③ Hole of Cam should be aligned with the hole of chassis, and the groove(■) of Cam Gear should be aligned with the hole of PC Gear (Fig B-26)

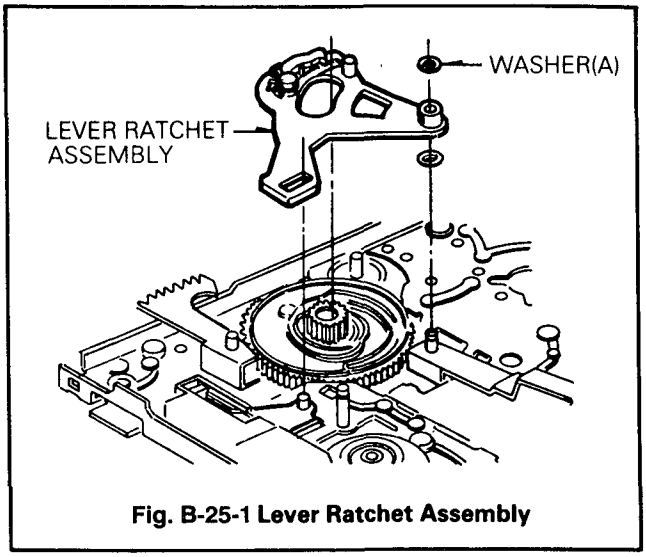


Fig. B-25-1 Lever Ratchet Assembly

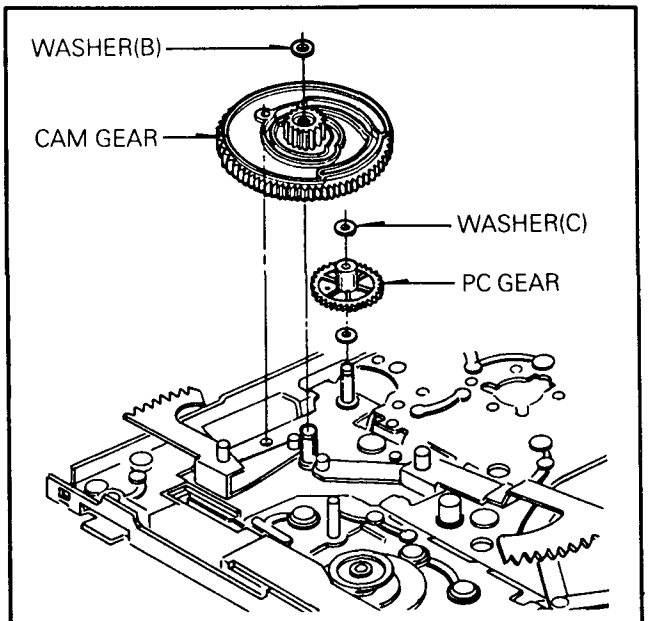


Fig. B-25-2 CAM/PC Gear

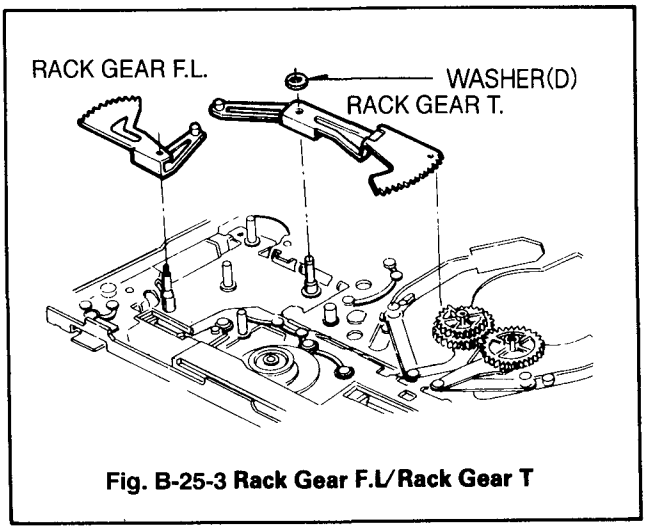


Fig. B-25-3 Rack Gear F.L/Rack Gear T

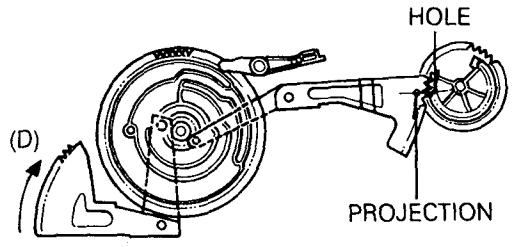


Fig. B-25-4 Rack Gear F.L/Rack Gear T/CAM Gear

26. PC Gear(Fig. B-26)

1) Remove the washer(C)
2) Remove the P C Gear by lifting it up

*** NOTE**

1) When reassembling

① The Groove of PC Gear should be aligned with the groove(V) of Cam Gear, and another hole of it should be aligned with the hole of chassis (Fig B-26)

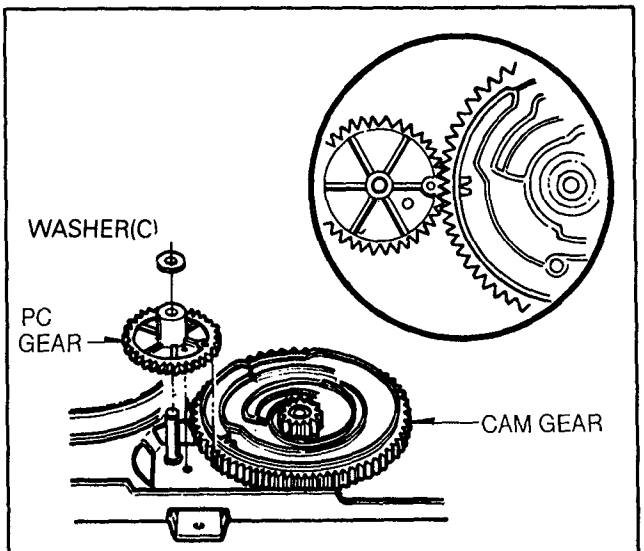


Fig. B-26 PC Gear

27. P2 and P3 Slant Assembly (Fig. B-27)

1) After finishing the disassembly of Drum Assembly, remove the P2 and P3 Slant Assembly by turning the Loading Gear(R) in the clockwise direction.(Loading direction)
2) Loosen the set screws
3) Remove the Roller Guide from the Slant Base.

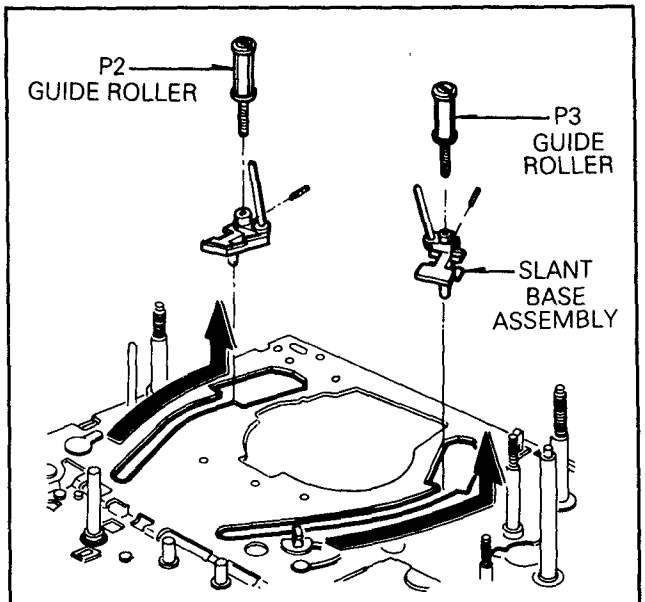


Fig. B-27 Slant Assembly

*** NOTE**

1) When disassembling and reassembling

① Use a Hexagonal wrench to remove set screw

② Take notice that the P2 and P3 Slant Assembly should not be changed from their original place.

28. Loading Gear Assembly(L),(R) (Fig. B-28)

1) Remove the Cam Gear, Rack-T.
2) Remove the P2 and P3 Slant Assembly by turning the Loading Gear(L),(R) in the Loading direction
3) Lift up the Loading Gear Assembly(L),(R) from the Deck Mechanism Assembly
4) Remove the Spring Load(L),(R)
5) Separate the Loading Gear(L), (R) from Arm Load(L), (R).

*** NOTE**

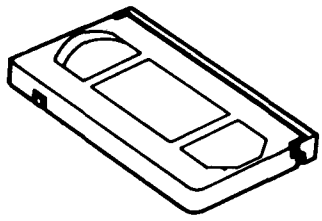
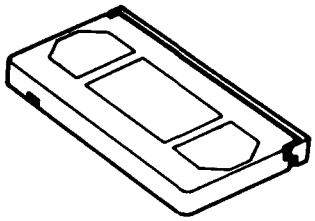
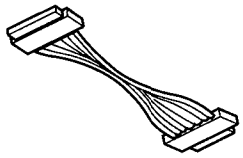
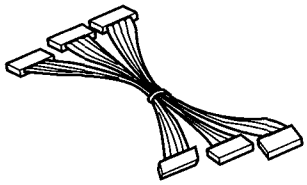
1) When reassembling

① Make sure that the Loading Gear(L) and (R) should not be changed from their original place.

② Align the groove of Loading Gear(L),(O) with the groove of Gear(R),(O)

SECTION 10
MECHANISM ADJUSTMENT

TOOLS AND FIXTURES FOR DECK

1. Back tension meter Parts No: J-6082-011-A 	2. Alignment tape Parts No: 9-909-498-01 	3. Troque gauge Parts No: H-7099-039-H
4. Troque gauge adaptor Parts No: H-7099-035-H 	5. Extension Cable (12P) Parts No: 9-909-340-01 	6. Extension Cable (12P X 3) Parts No: 9-909-339-01 

10-1. MECHANISM STATE SWITCH (MODE SWITCH) CHECK

Purpose: To detect accurately the mechanism state and prevent the mechanism from malfunction

Test Equipment/Fixture	VCR State	Check Point
● Blank tape	● Eject Mode (with cassette ejected)	● Mechanism state switch (Mode Switch and Cam)

Check Procedure

1) Turn the VCR on and eject the tape by pressing eject button
2) Remove the Cabinet Top, the Main P C Board and the CST Housing. Then push the CST IN/OUT switch (Loca #137) and eject button at the same time.
3) Turn the worm (Loca #082) of Loading Motor Assembly (Loca #A10) to the left side (counter-clockwise) to align the three holes (A) of the Pinch Gear, the P C Gear and the Chassis
4) Remove the Bottom Cover and then check that the groove (V) and the hole (O) of Mode S/W are aligned each other. If the above alignment is not obtained, adjust as follows
   (1) Remove the Bracket Assembly Bottom and the Capstan Belt in the state of power off
   (2) Remove the P C B Assembly, align the groove (V) and the hole (O) of Mode S/W each other and then reassemble the P C B Assembly
   (3) Turn the power on and perform the various operations to check that the loading and the unloading are correct

Check Diagram

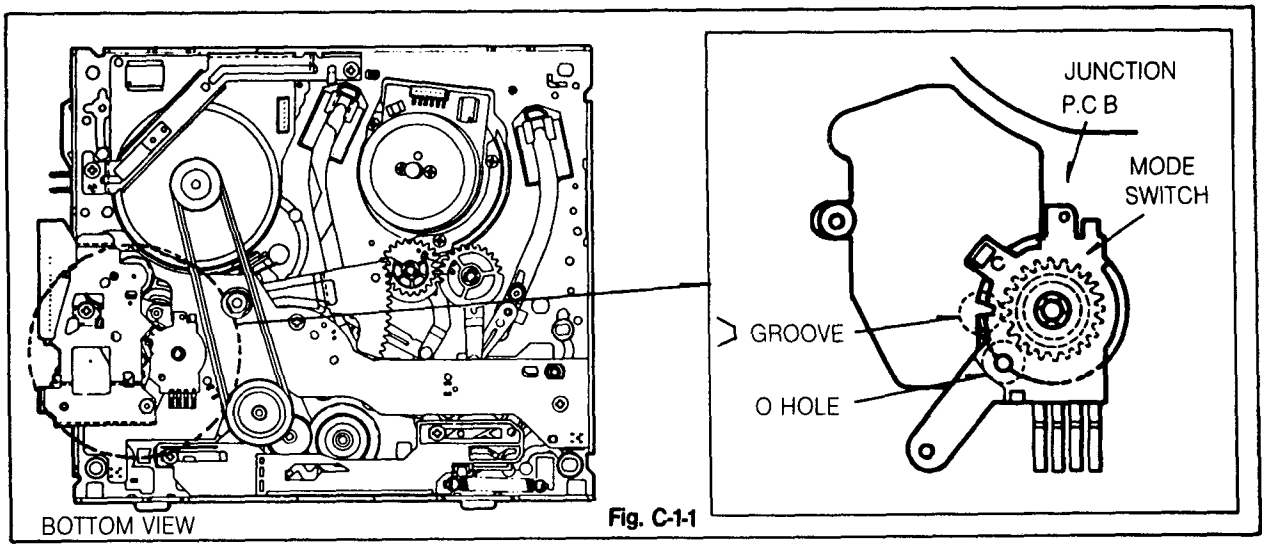


Fig. C-1-1

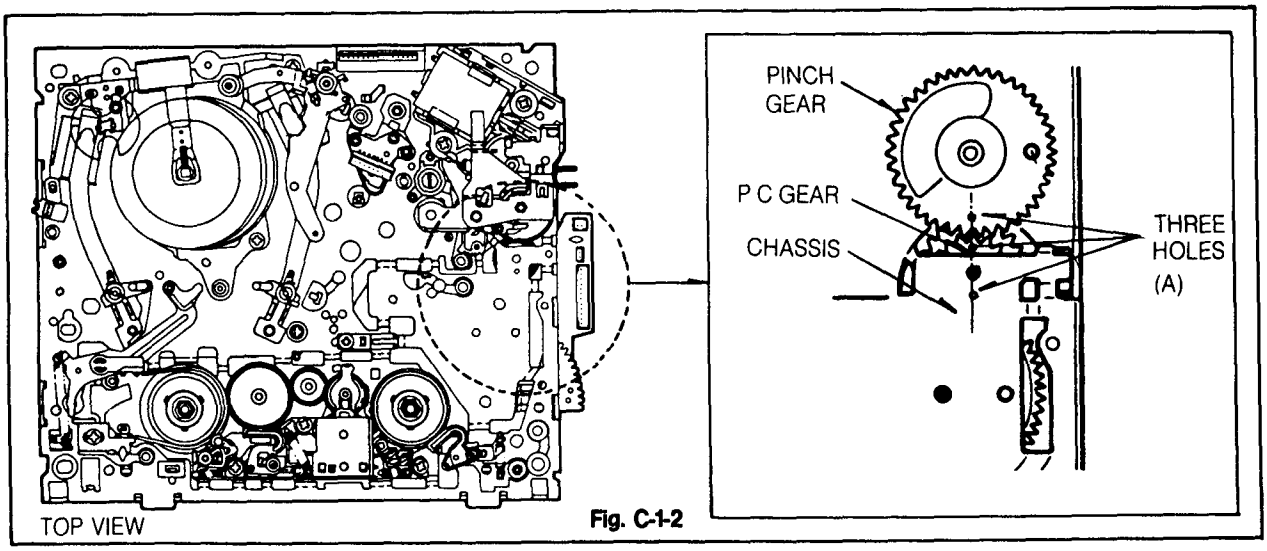


Fig. C-1-2

10-2. PREPARATON FOR ADJUSTMENT (To set VCR to the loading state without inserting a cassette)

1) Unplug the power cord from the AC outlet
2) Remove the Cabinet Top and Front Loading mechanism.
3) Plug the power cord into the AC outlet
4) Turn the VCR on and push the tact switch in the PCB Assembly.
   The VCR can accept input of each mode in this case However the rewind and review operation cannot be performed for more than a few seconds because the take-up reel table is in the stop state and reel pulses cannot be detected

(NOTE)
Always return the VCR to the Front Loading Mechanism Assembling State in the following order after the above operations have been performed

1) Press the Eject button after turning the power on
2) Wait for about 10 seconds until searching out the assembly position
3) Assemble the Front Loading Mechanism and connect the Front Loading Mechanism Connector
4) Refer to the "Front Loading Mechanism Disassembly" which is described previously

10-3. REEL TABLE HEIGHT ADJUSTMENT

Purpose: To make the tension of tape constant so that the contact between the video heads and tape is stabilized

Test Equipment/Fixture	VCR State	Adjustment Point
● Tension Meter (Tension adjustment)	● Play without cassette and with a Tension Meter	● Holder Band(B)

Adjustment Procedures

〈Position Adjustment〉

1) Perform loading without inserting a tape and loosen the screw that attaches the Holder Band(B) to the Deck Mechanism Assembly.
2) Insert the (-)type driver between the Holder Band(B) and the "V" groove of the chassis.
3) Move the Holder Band(B) right and left and align the center of tension post(Guide T-Post) with the center of P1(Shaft P1).(tolerance:Less than ±0.3mm)
4) Tighten the screw that attaches the Holder Band(B) to Deck Mechanism Assembly.

〈Tension Adjustment〉

1) Play the Tension Meter and read the Tension Meter: 38g•cm±4g•cm(reference value).
2) If the result is abnormal.
   (1) over the standard:loosen the screw, move the Holder Band(B) to the right a little and then tighten the screw and make sure that this adjustment is correct.
   (2) below the standard:loosen the screw, move the Holder Band(B) to the left a little and then tighten the screw and make sure that this adjustment is correct.

****CAUTION****

The range of movement of Holder Band(B) should be within ±1 5mm while being adjusted

If the range is over, you should recheck the Reel Brake, Tension Arm and Spring.

Adjustment Diagram

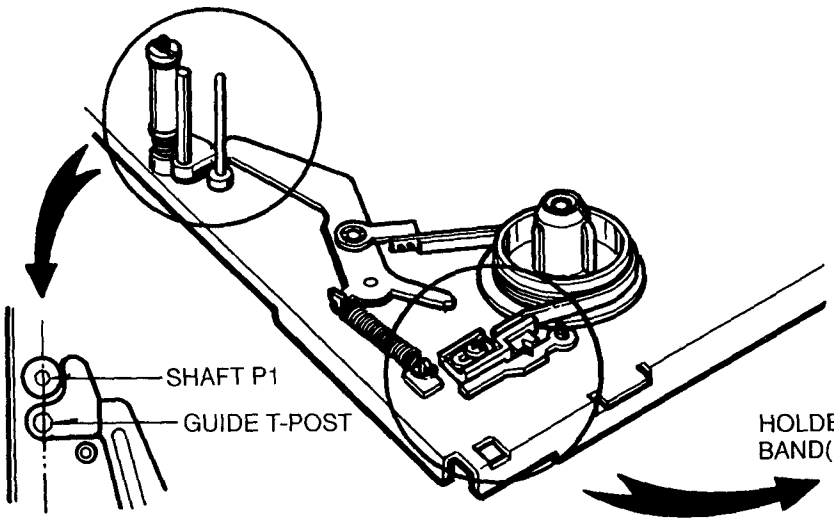


Fig. C-3-1

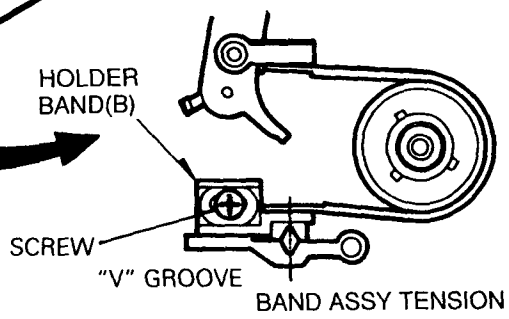


Fig. C-3-2

10-4. CHECKING TORQUE

Purpose: It is necessary to check the tension, torque and compression force at the tape take-up section and moving section to make the tape run smoothly and satisfy the basic performance of the VCR Check these if the tape does not run smoothly or the tape speed is abnormal

Test Equipment/Fixture	VCR state
● Torque Gauge ● Torque Gauge Adaptor ● Cassette Torque Meter SRK-VHT-063 : Play, Cue SRK-VHT-303 : Review	● Set the VCR to each operation mode without inserting a cassette (See '2 Preparation for Adjustment')

Item	VCR Operation mode	Measurement Reel	Measurement Values
Main brake torque.	Eject	Supply and take-up reels	600g cm or more
Slack removal torque	Unloading(power off)	Supply reel	120~220g·cm
Fast forward torque	Fast forward	Take-up reel	600g·cm or more
Rewind torque	Rewind	Supply reel	600g·cm or more
Play take-up torque	Play	Take-Up reel	90~150g·cm
Review Torque	Review	Supply Reel	120~180 g.cm
CUE Torque	Cue	Take-Up Reel	110~170 g.cm

Checking Method

The values are measured by using a torque gauge and torque gauge adaptor with the torque gauge fixed

Note: This value is measured when the VCR is shifted in the unloading direction from the fast forward or rewind mode and quick braking is applied to both Reel Tables

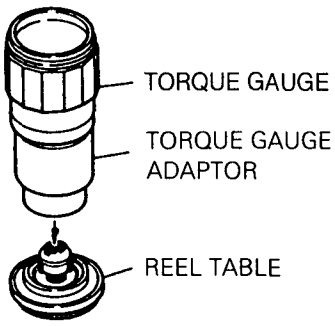


Fig. C-4

10-5. GUIDE ROLLER HEIGHT ADJUSTMENT

Purpose: To regulate the height of tape so that the bottom of tape runs along the tape guide line on the lower drum

A. Preliminary Adjustment

Test Equipment/Fixture	VCR State	Adjustment Point
● Hexagonal Wrench or Bended Drive (+) Type ● Post Height Adjusting Driver	● Play an alignment tape	● Guide Roller Height Adjustment Screws on the Supply and Take-Up Guide Rollers

Adjustment Procedure

1) Perform the precise adjustment.
2) When the Guide Roller is damaged, release the Guide Roller retaining screw and then replace the Guide Roller

Adjustment Diagram

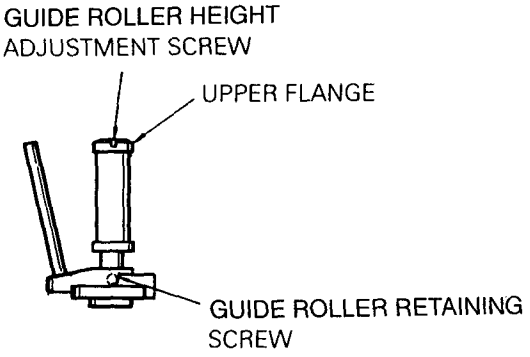


Fig. C-5-1

10-6. PRECISE ADJUSTMENT

Test Equipment/Fixture	Test Equipment Connection Points	VCR State	Adjustment Point
● Oscilloscope ● Post Height Adjusting Driver ● Alignment Tape(30HMP-2) ● Hexagonal wrench	● CH-1·PB RF Envelope ● CH-2 (NTSC : SW30Hz / PAL : SW25Hz) ● Head Switching Output Point ● RF Envelope Output Point	● Play an alignment tape	● Guide Roller Height Adjustment Screws

Adjustment Procedure

1) Play an alignment tape after connecting the probe of the oscilloscope to RF Envelope Output Test Point and Head Switching Output Test Point
2) Tracking control(in PB mode)·Center position(When this adjustment is performed after the drum assembly has been replaced, set the tracking control so that the RF output is maximum)
3) Height adjustment screw Flatten the RF waveform
4) Turn(Move) the tracking control(playback) clockwise and counterclockwise (to the right and left)
5) Check that any drop of RF output is uniform at the start and end of the waveform.

****CAUTION****
If the adjustment is excessive or insufficient the tape is jammed or folded.

Waveform Diagrams

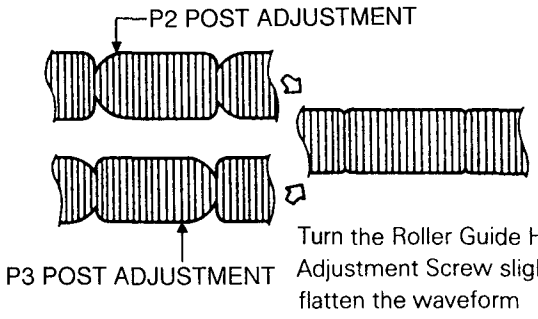
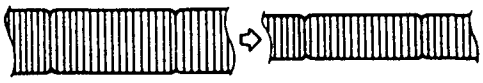


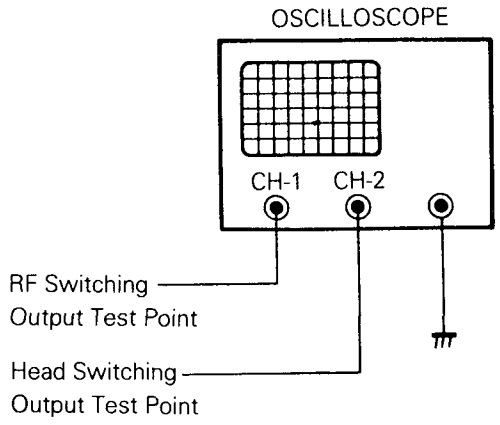
Fig. C-5-2



Tracking control at center — Turn(Move) the tracking control to both directions

Fig. C-5-3

Connection Diagram



10-7. AUDIO/CONTROL (A/C) HEAD ADJUSTMENT

Purpose: To keep the contact between the tape and head so that the specificed track is recorded and played back

A. Preliminary Adjustment (Perform the preliminary adjustment, when there is no Audio Output signal with alignment tape.)

Test Equipment/Fixture	VCR State	Adjustment Points
● M3 Nut Driver		● Special screw ● Cone Point Screw for tilt ● Azimuth Adjustment Screw
● Blank tape	● Run the blank tape	● A/C Head Adjuster

Adjustment procedure/Adjustment Diagram

1) Tighten the special screw so that the spring section protrudes 6.4mm(approx.) over the top of Head Base (1).

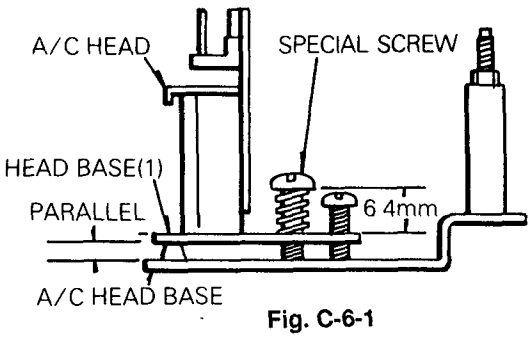


Fig. C-6-1

2) Turn the Azimuth Adjustment Screw and Cone Point Screw so that the Head Base(1) and A/C Head Base are parallel

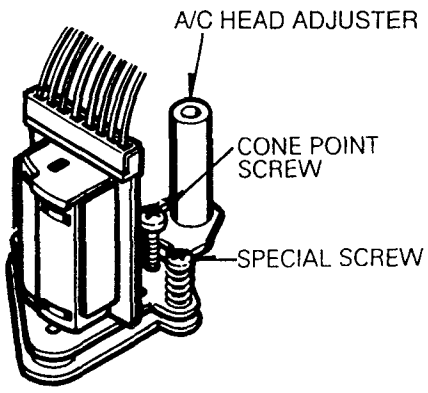


Fig. C-6-2

3) Load a blank tape and set the VCR to the play mode.

4) Confirm that the tape runs fittingly to the lower limit of the P4 post. Also confirm that the tape runs smoothly.

5) If adjustment is required, turn Cone Point Screw clockwise until curling is apparent at the lower edge of P4. Then turn Cone Point Screw counterclockwise until the curling smooths out.

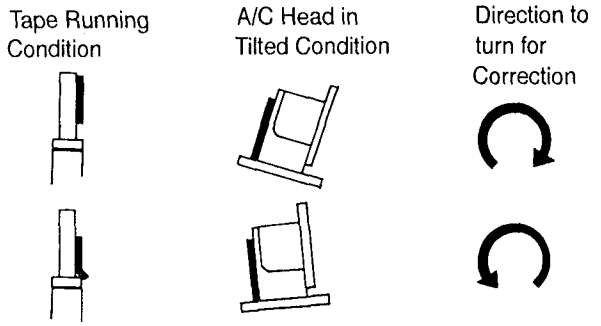


Fig. C-6-3

6) Check that there is no conspicuous curling and folding around the A/C head. If there is conspicuous curling or folding, readjust the Cone Point Screw, Azimuth Adjustment Screw and A/C Head Adjuster. When the bottom edge of tape is 0.20~0.25mm from the bottom edge of the control head's core, the height of A/C head is ideal.

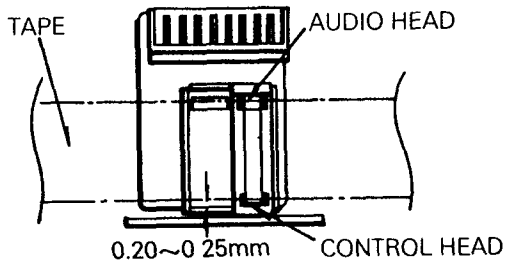


Fig. C-6-4

7) If necessary repeat steps 1 through 4 until a precise adjustment is achieved.

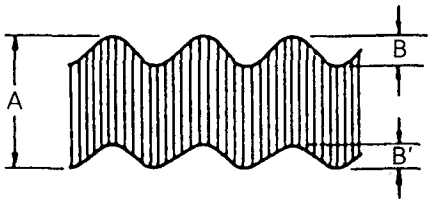
10-8. PRECISE ADJUSTMENT

Test Equipment/Fixture	Test Equipment Connection Point	VCR State	Adjustment Points
● Oscilloscope ● Alignment tapes ● M3 Nut Driver	● Audio output jack	● Play an alignment tape 1KHz, 7KHz sections	● Azimuth Adjustment Screw ● A/C Head adjuster ● Cone point screw

Adjustment Procedure

1) Connect the probe of oscilloscope to audio output jack
2) Adjust the Azimuth Adjustment Screw, A/C Head adjuster and cone point screw slightly and alternately so that an Audio 1KHz output is maximum and flat. (minimum fluctuation).
3) Adjust the Azimuth Adjustment Screw slightly and alternately so that the Audio 7KHz output is maximum

Waveform Diagram



A.Maximum BB'·Minimum

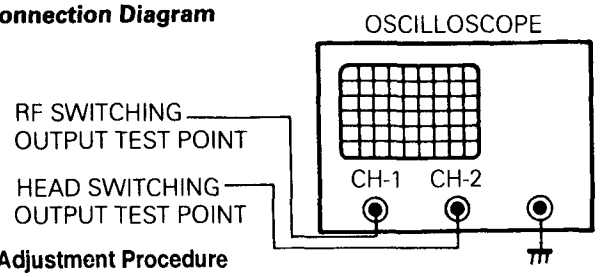
Fig. C-6-5

10-9. X-VALUE ADJUSTMENT

Purpose: To obtain compatibility with other VCRs

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
● Oscilloscope ● Alignment tapes ● Post Height Adjusting Driver	● CH-1 PB RF Envelope ● CH-2 SW 30Hz ● Head Switching Output Test Point ● RF Envelope Output Test Point	● Play an alignment tape	● Adjust X

Connection Diagram



Adjustment Procedure

1) Insert a cassette tape, and then "AUTO TRACKING" will be displayed on the Digitron, then push the Tracking ⊕ or ⊖ Keys one time as soon as possible to make the VCR release the Auto Tracking
2) Turn the Adjust X to the maximum RF Envelope level when the VCR is free from the Auto tracking
3) If RF envelope output is maximized from the center click position in the right direction (clockwise), set the tracking control to the center and turn the X Adjust counterclockwise.
4) If in the left direction (counterclockwise), turn it clockwise by the same method.
5) In case of the 30 μm, head will trace over a 60 μm width track, readjust it so that RF Envelope output begins falling at the same angle when tracking control is turned either left or right

Adjustment Diagram

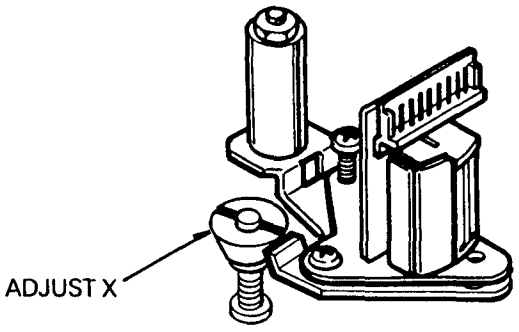


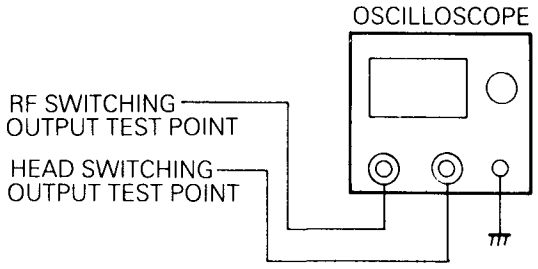
Fig. C-7

10-10. ADJUSTMENT AFTER REPLACING DRUM ASSEMBLY (VIDEO HEADS)

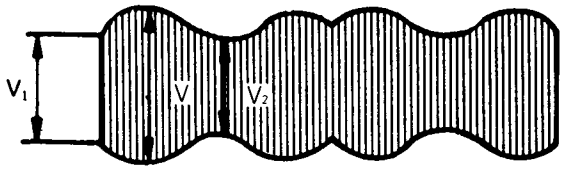
Purpose: To suppress drift in the height relative to the Guide Roller and drift of the X Value after replacing the drum

Test Equipment/Fixture	Test Equipment Connection Points	VCR State	Adjustment Points
● Oscilloscope ● Post Height Adjusting Driver ● Alignment tape ● Blank tape ● M3 Nut Driver	Checking the flatness ● CH-1 PB RF Envelope ● CH-2 (NTSC : SW30Hz / PAL : SW25Hz) ● Head Switching Output Point ● RF Envelope Output Point	● Run the blank tape ● Play an alignment tape	● Guide Rollers Precise Adjustment ● Switching point ● Tracking point ● X-Value

Connection Diagram



Waveform Diagram



V_1/V MAX ≥ 0.7
V_2/V MAX ≥ 0.8
RF ENVELOPE OUTPUT

Checking/Adjustment Procedure

1) Run the blank tape, check and adjust whether the Roller Guide is curling or creasing tape around the Roller Guide
2) Check the RF envelope output flatness and adjust the Roller Guide Height while playing an alignment tape
3) Adjust the head switching point
4) Check that RF envelope output is maximum when the tracking is at the initial position
5) Adjust the Tracking Preset and X-Value Adjust with X Adjust

Fig. C-8

10-11. CHECK OF TAPE TRAVEL AFTER REASSEMBLING DECK ASSEMBLY

Check Audio and RF Locking Time during playback after CUE or REV.

Test Equipment/Fixture	Specification	Test Equipment Connection Point	VCR State
● Oscilloscope ● Alignment tape (with 6H 3kHz Color Bar Signal) ● Stop Watch	● RF Locking Time : Less than 5 sec. ● Audio Locking Time Less than 10 sec.	● CH-1 : PB RF Envelope ● CH-2 : Audio Output ● RF Envelope Output Point ● Audio Output Jack	● Play an alignment tape (with 6H 3kHz Color Bar Signal)

Checking Procedure

1) Change the mode of CUE or REV to play
2) At this time, confirm that the Locking Time of Audio and RF Output Waveform fits to specification.
3) If the results checked above are abnormal, reapeat adjustments 4 through 8.

※ 6H : LP

Check the coincidence of both Audio and Video Sync.(Lip Sync.)

Test Equipment/Fixture	Specification	Test Equipment Connection Point	VCR State
● Oscilloscope ● 2H 9V Tape(for X-Value Adjustment Coincidence) or alignment tape	● Less than ±0.5V	● CH-1 : PB RF Envelope ● CH-2 : Audio Output ● RF Envelope Output Point ● Audio Output Jack	● Play a 2H 9V tape or an alignment tape.

Checking Procedure

1) Confirm that the period Ⓐ of Fig. C-9-1 is within ± 0.5V.
2) If the result is abnormal, repeat adjustment #7. (X-Value adjustment).

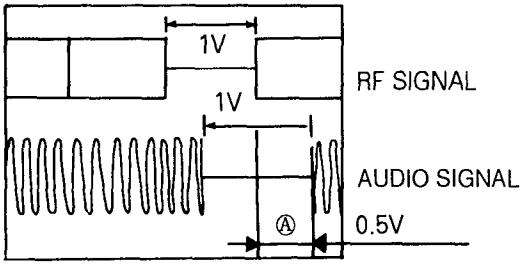


Fig. C-9-1

※ 2H . SP, V: Vertical

Check the occurance of tape curl and jam

Test Equipment/Fixture	Specification	VCR State
● T-160 Tape ● T-120 Tape	● Be sure there is no jam or curl at the beginning, the middle period or the end of the T-160 tape.	● Run the CUE, REV play mode at the beginning and the end of the tape

Checking Procedure

1) Confirm whether the state of each transportation post is normal.
2) Make sure nothing is wrong with the operation of the Counter, when the lower part of tape is folded.
3) Be sure there is nothing wrong in the Audio signal, when the upper part of tape is folded.
4) If the result is abnormal, repeat adjustment #5 and #6.

Check the adjustment state of Take-Up Guide

Test Equipment/Fixture	Specification
● T-120 Tape ● Take-Up Guide Adjusting Driver	● Review · Travel the tape that align the top of the P4 Guide and the bottom of the Tape or be folded. ● Play : Travel the tape that align the top of the P4 Guide and the bottom of the Tape

Checking Procedure

1) Run the CUE or PLAY mode at the middle period or the end of the T-120 tape.
2) Run the REV mode at the play or cue part of tape.
3) At this time, confirm that the change of tape height at the P4 Guide fits to specification.
4) If the result is abnormal, refer to Table 9-1
5) Play the beginning of T-120 tape(within 5 min.)
6) Confirm that the state of tape transportation fit to specification in P4 Guide.
7) Remove the Tension Arm Assembly by rotating in the clockwise direction and then confirm that the state of tape transportation fit to specification.
8) If the result is abnormal, refer to Table 9-1

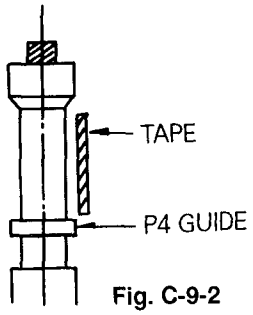


Fig. C-9-2

PLAY Mode	REV Mode	Adjustment Method
Tape Falling	Tape Lift	Bend the shaft of the direction +Y.
Tape Lift	Tape Falling	Bend the shaft of the direction -Y.

Table 9-1

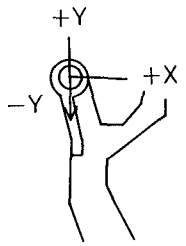


Fig. C-9-3

10-12. MAINTENANCE/INSPECTION PROCEDURE

(1) Required Maintenance

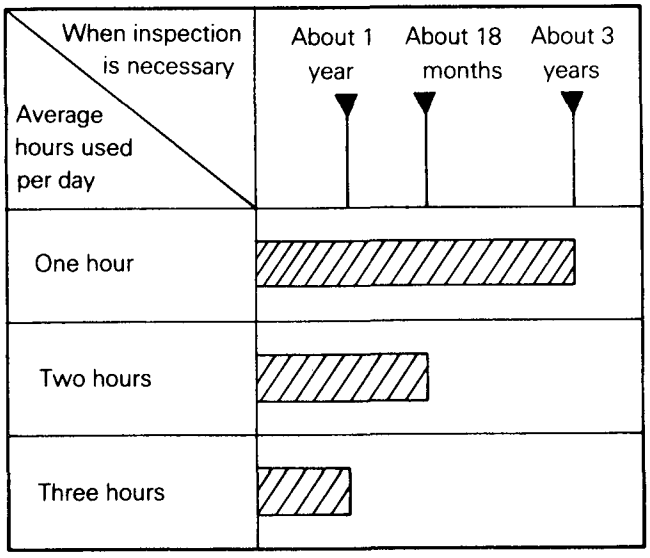
The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise, at tolerances of 1/1000mm, to ensure compatiblity with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure good picture, periodic inspection and maintenance, including replacement of worn out parts and lubrication, are necessary

(2) Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used

But, in general home use, a good picture will be maintained if the inspection and maintenance is made every 1,000hours The table below shows the relation between time used and inspection period

Table 1



(3) Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit

Check with the customer to find out how often the unit is used, and then determine that the unit is ready for in spection and maintenance Check the following parts

Table 2

Phenomenon	Inspection
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, belt or flywheel belt
Vertical jitter, horizontal jitter	Dirt on video head or in tape transport system
Color beats	Dirt on full-erase head
Low volume or sound distorted	Dirt on audio/control head
Fast forward or rewind is not done or rotation is slow	Dirt on belt

(4) Supplies Required for Inspection and Maintenance

(1) Greases Kanto G-31(or equivalent)
(2) Alcohol(Isopropyl Alcohol)
(3) Cleaning Patches

5) Maintenance Procedure

5-1) Cleaning

(1) Cleaning video head

First use a cleaning tape If dirt on head is too stubborn to remove by tape, use the cleaning patch Coat the cleaning patch with alcohol(Isopropyl Alcohol) to the point indicated. Touch the cleaning patch to the head tip and gently turn the head(rotating cylinder) right and left.

(Do not move the cleaning patch vertically and make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged)

Thoroughly dry the head. Then run test tape. If alcohol (Isopropyl Alcohol) remains on the video head, the tape may be damaged when it comes into contact with the head surface.

(2) Clean the tape transport system and drive system, etc, by wiping with a cleaning patch wetted with alcohol (Isopropyl Alcohol).

Note:

① It is the tape transport system which comes into contact with the running tape The drive system consists of those parts which move the tape

② Make sure that during cleaning you do not touch the tape transport system with the tip of a screw driver and no force is applied to the system that would cause deforming

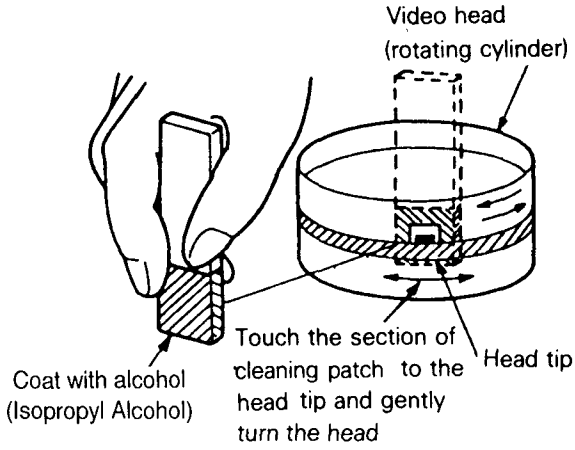


Fig. C-10-1

5-2) *Greasing*

(1) Greasing guidelines

Apply grease, with a cleaning patch. Do not use excess grease It may come into contact with the tape transport of drive system Wipe any excess and clean with cleaning patch wetted in alcohol(Isopropyl Alcohol).

(2) Periodic greasing

Grease specified locations every 5,000hours

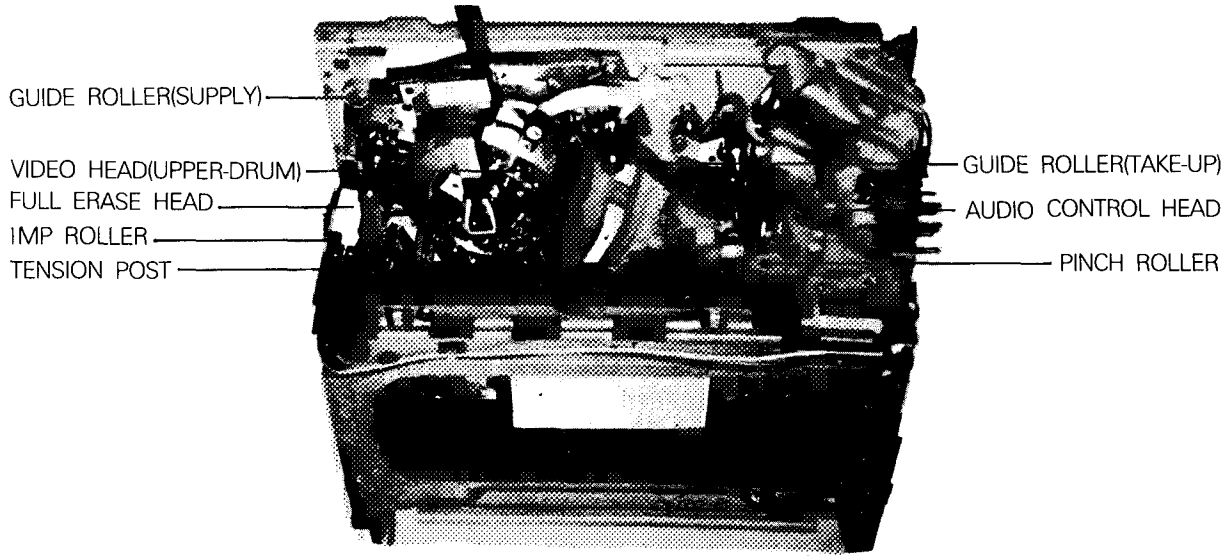


Fig. C-10-2 Tape Transport System

Phenomenon	Inspection	Replacement	
Color beats	Dirt on full-erase head	○	→ ①
Poor S/N no color	Dirt on video head	○	→ ②
Vertical jitter	Dirt on video head Dirt in tape transport system	○	→ ③
Low volume, Sound distorted	Dirt on audio/control head	○	→ ④
Tape does not run Tape is slack	Dirt on pinch roller	○	→ ⑤

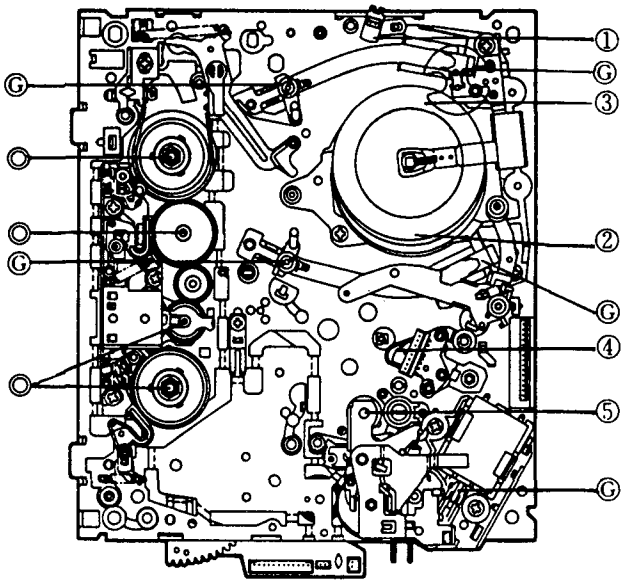


Fig. A-11 Top View of Mechanism

Phenomenon	Inspection Location	Replacement	
Do not fast forward or rewind, or rotation is slow Tape does not run Slack tape	Dirt on reel belt	○	→ ⑥

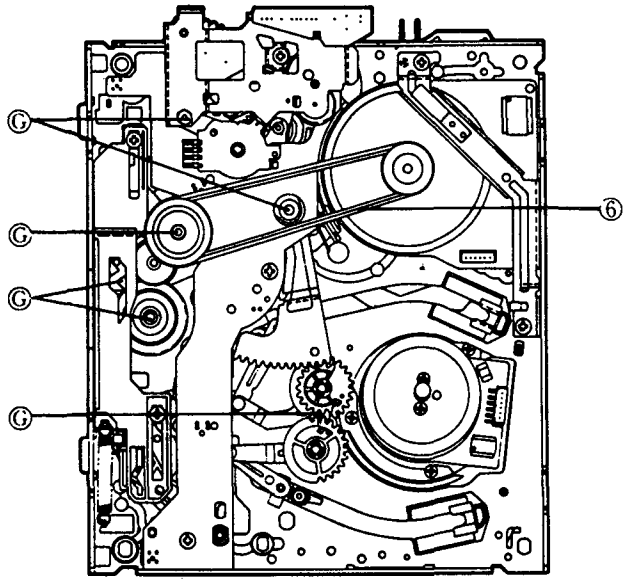
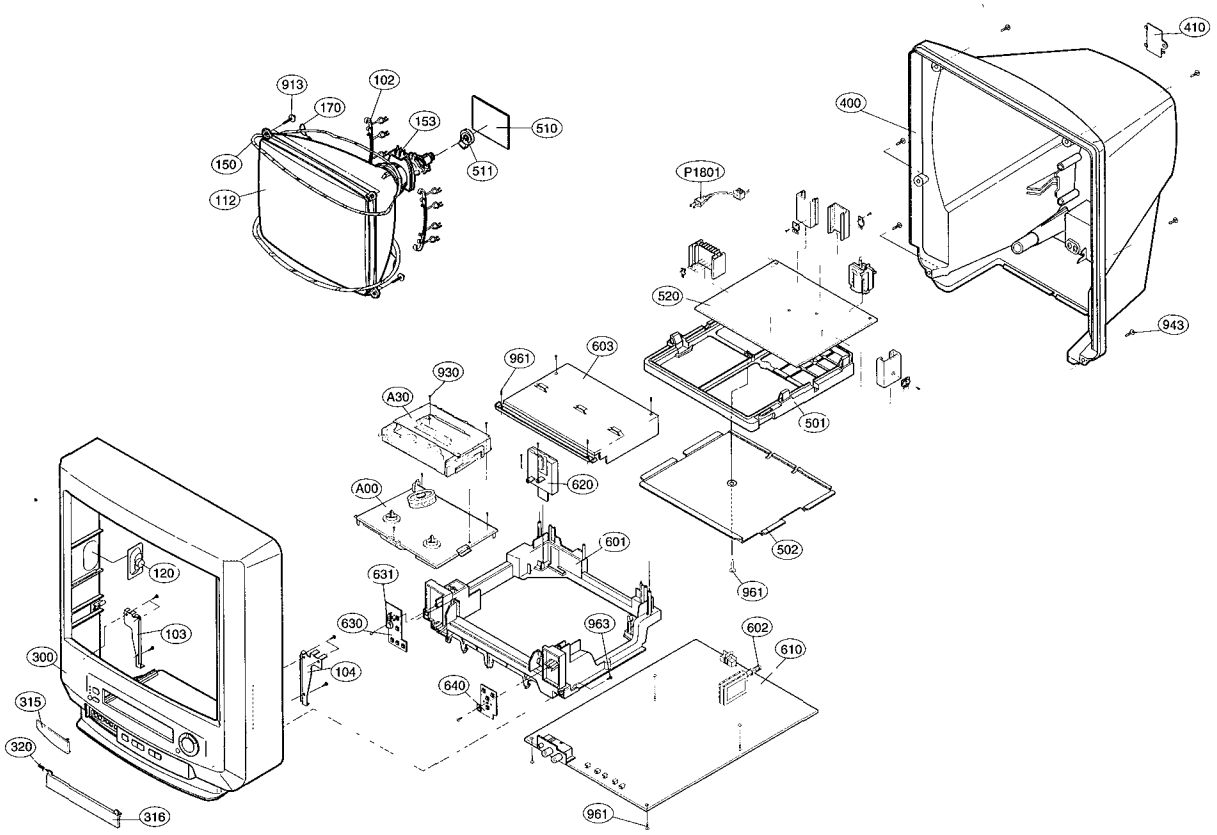


Fig. A-12 Bottom View of Mechanism

Note: If locations marked with ○ do not operate normally after cleaning, check for wear and replace.
See the EXPLODED VIEWS at the end of this manual as well as the above illustrations for the sections to be lubricated and greased.

Ⓖ:Grease
Ⓞ:Oil

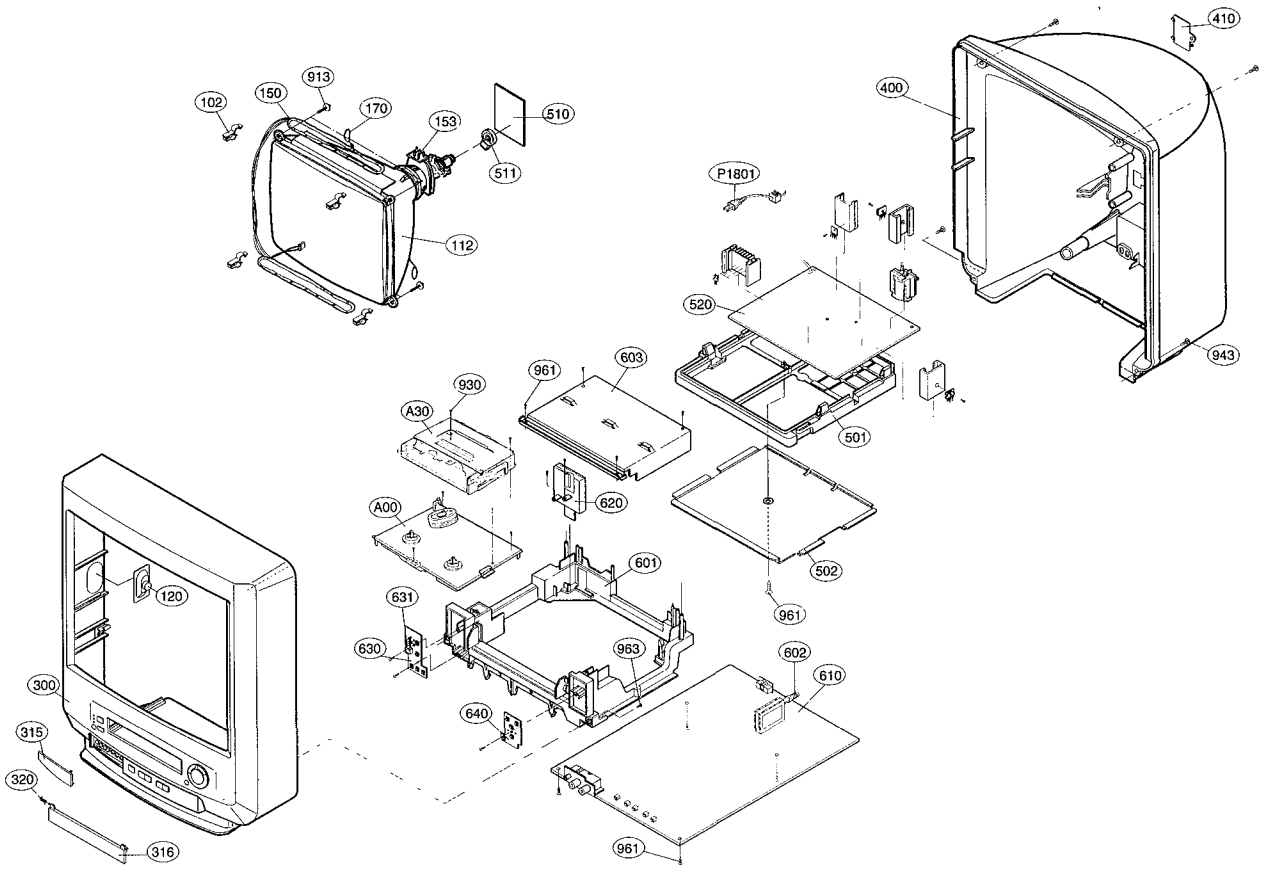
SECTION 11
EXPLODED VIEW (KV-20VM30)



REF NO	PART NO	DESCRIPTION	REMARK
102	9-909-865-01	HOLDER,D-COIL	
103	9-939-424-01	SUPPORTER, CPT (L)	
104	9-939-425-01	SUPPORTER, CPT (R)	
112	⚠ 9-938-768-01	PICTURE TUBE,A51LJX250X	
120	9-907-964-01	SPEAKER	
150	⚠ 9-909-855-01	COIL,DEGAUSSING	
153	⚠ 8-451-240-11	DEFLECTION YOKE	
170	9-909-857-01	TENSION SPRING	
300	9-939-352-01	CABINET ASSY KV-20VM30	
315	9-939-353-01	DOOR,CONTROL	
316	9-939-354-01	DOOR,CST	
320	9-907-944-01	SPRING,COIL(FOR DOOR,CST)	
400	9-939-355-01	BACK COVER ASSY KV-20VM30	
410	9-939-356-01	PLATE,POWER CORD	
501	9-939-357-01	D BRACKET	
502	9-939-422-01	PLATE, SHIELD BOTTOM	
510	9-939-358-01	C MOUNT	

REF NO	PART NO	DESCRIPTION	REMARK
511	9-909-869-01	SOCKET PICTURE TUBE	
520	9-939-359-01	D MOUNT	
601	9-939-360-01	VCR BRACKET	
602	9-939-361-01	ADAPTER,CONNECTING ANT	
603	9-939-362-01	TOP COVER	
610	9-939-363-01	MA MOUNT	
620	9-939-364-01	RP MOUNT	
630	9-939-365-01	MF LEFT MOUNT	
640	9-939-367-01	MF RIGHT MOUNT	
913	9-909-864-01	SCREW ASSY,HEXAGON HEAD	
930	9-939-368-01	SCREW MW+3*8	
943	9-909-480-01	SCREW,PAN HEAD D4 L16	
950	7-685-648-79	SCREW,BRAZ WASH HD 3 0 L12 0	
963	9-908-077-01	SCREW,TRUSS HEAD D4 L16	
P1801	⚠ 9-939-357-01	CORD,POWER	

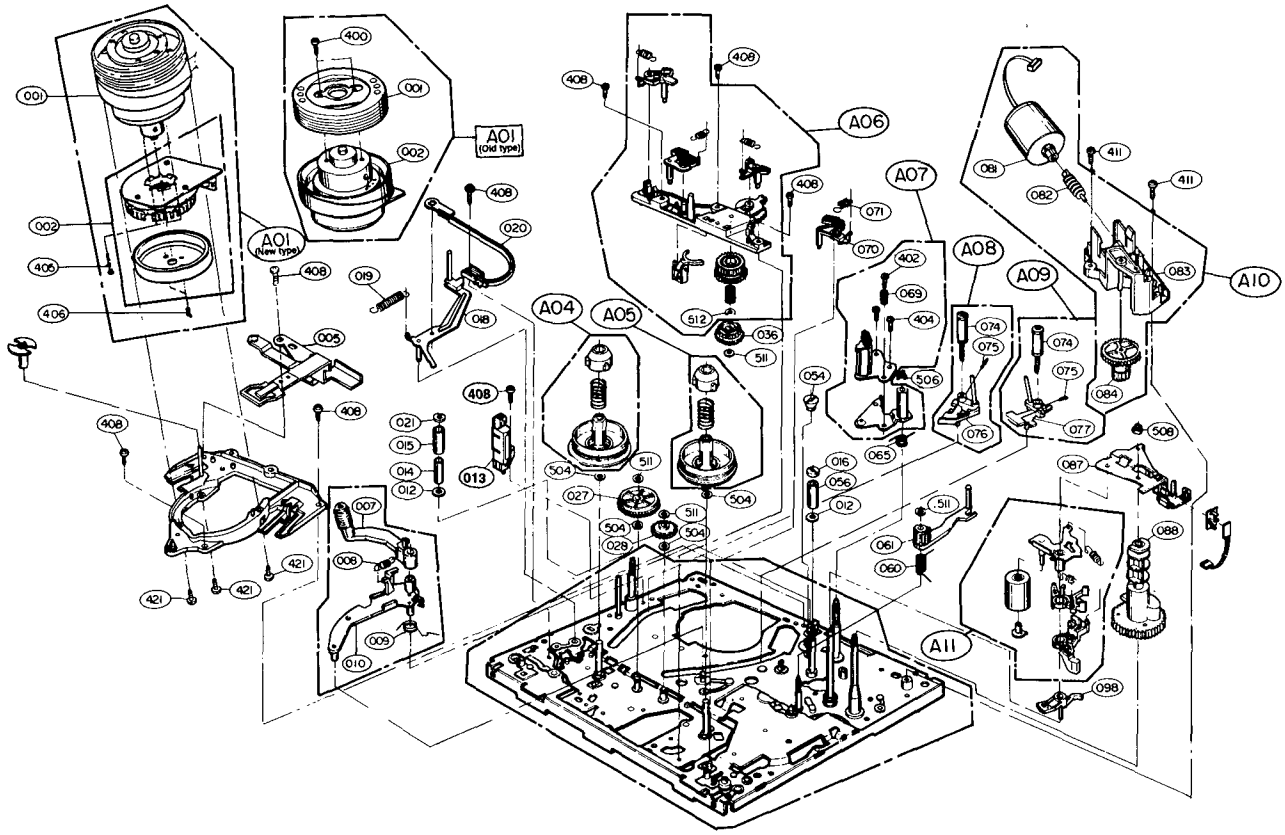
EXPLODED VIEW (KV-13VM30/31)



REF NO	PART NO	DESCRIPTION	REMARK
102	9-908-964-01	HOLDER,D-COIL	
112	⚠ 8-735-362-01	PICTURE TUBE,A34JBL70X	
120	9-907-964-01	SPEAKER	
150	⚠ 9-907-962-01	COIL,DEGAUSSING	
153	⚠ 8-451-416-11	DEFLECTION YOKE	
170	9-907-961-01	TENSION SPRING	
300	9-939-464-01	CABINET ASSY KV-13VM30	
300	9-939-465-01	CABINET ASSY KV-13VM31	
315	9-939-466-01	DOOR,CONTROL KV-13VM30	
315	9-939-467-01	DOOR,CONTROL KV-13VM31	
316	9-939-354-01	DOOR,CST	
316	9-939-591-01	DOOR,CST KV-13VM31	
320	9-907-944-01	SPRING,COIL(FOR DOOR,CST)	
400	9-939-468-01	BACK COVER ASSY KV-13VM30	
400	9-939-469-01	BACK COVER ASSY KV-13VM31	
410	9-939-356-01	PLATE,POWER CORD	
410	9-939-470-01	PLATE,POWER CORD KV-13VM31	
501	9-939-357-01	D BRACKET	
502	9-939-422-01	PLATE, SHIELD BOTTOM	
510	9-939-461-01	C MOUNT	

REF NO	PART NO	DESCRIPTION	REMARK
511	1-526-819-11	SOCKET PICTURE TUBE	
520	9-939-462-01	D MOUNT	
601	9-939-360-01	VCR BRACKET	
602	9-939-361-01	ADAPTER,CONNECTING ANT	
603	9-939-362-01	TOP COVER	
610	9-939-463-01	MA MOUNT	
620	9-939-364-01	RP MOUNT	
630	9-939-365-01	MF LEFT MOUNT	
640	9-939-367-01	MF RIGHT MOUNT	
913	9-908-080-01	SCREW ASSY,HEXAGON HEAD	
930	9-939-368-01	SCREW MW+3*8	
943	9-909-480-01	SCREW,PAN HEAD D4 L16	
950	7-685-648-79	SCREW,BRAZ WASH HD 3 0 L12 0	
963	9-908-077-01	SCREW,TRUSS HEAD D4 L16	
P1801	⚠ 9-939-337-01	CORD,POWER	
P1801	⚠ 9-939-590-01	CORD,POWER (WHITE)	

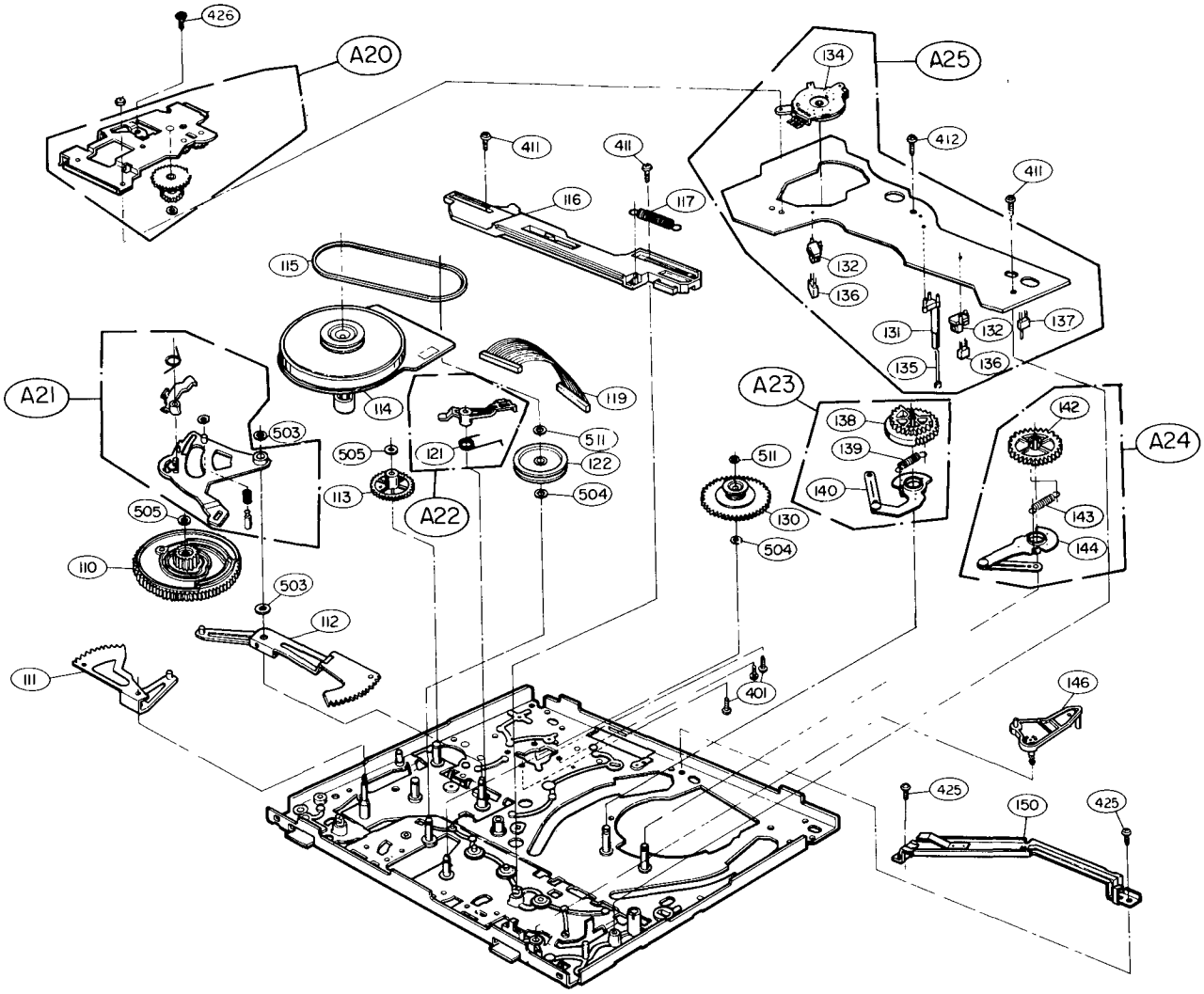
Moving Mechanism Section(I)



REF NO	PART NO	DESCRIPTION	REMARK
A01	9-908-441-01	DRUM ASSY GSA D-17 NTSC	
A04	9-908-362-01	REEL ASSY S17	
A05	9-908-288-01	REEL ASSY T17	
A06	9-908-243-01	BRACKET ASSY F/R	
A07	9-908-228-01	BASE ASSY A/C	
A08	9-908-202-01	BASE ASSY,P2	
A09	9-908-196-01	BASE ASSY,P3	
A10	9-908-216-01	MOTOR ASSY LOAD	
A11	9-908-313-01	LEVER ASSY PINCH	
001	9-939-417-01	DRUM SUB ASSY	
002	9-908-442-01	DRUM ASSY, LOWER (D17-2CH)	
005	9-908-341-01	BASE ASSY D-BRUSH	
007	9-908-388-01	ARM SUB ASSY, CU	
008	9-908-395-01	SPRING CU	
009	9-908-394-01	SPRING CL	
010	9-908-387-01	ARM CL	
012	9-908-344-01	GUIDE 17	
013	9-908-343-01	HEAD FE, HVFHF0010AK	
014	9-908-345-01	SLEEVE P1	
015	9-908-346-01	ROLLER P1	
016	9-908-382-01	ADJUST P(4)	
018	9-908-206-01	ARM ASSY TENSION	
019	9-908-355-01	SPRING TENSION	
020	9-908-211-01	BAND ASSY TENSION	
021	9-908-348-01	STOPPER P1	
027	9-908-360-01	GEAR IDLE (A) POM 3G	
028	9-908-361-01	GEAR IDLE (B) POM 3G	
036	9-908-358-01	GEAR F/R	
054	9-908-357-01	ADJUST X-ASSY	
056	9-908-353-01	SLEEVE P4	

REF NO	PART NO	DESCRIPTION	REMARK
060	9-908-369-01	SPRING T/UP	
061	9-908-293-01	ARM ASSY T/UP	
065	9-908-356-01	SPRING A/C	
069	9-908-241-01	SPRING AZIMUTH	
070	9-908-338-01	BRACK ASSY T-MAIN	
071	9-908-380-01	SPRING TMB	
074	9-908-198-01	ROLLER ASSY, GUIDE	
075	9-908-199-01	SCREW MINIATURE	
076	9-908-203-01	BASE SUB ASSY, SLALT (L, W-W)	
077	9-908-197-01	BASE SUB ASSY, SLALT (R, W-W)	
081	9-908-224-01	MOTOR SUB ASSY, L	
082	9-908-221-01	WORM ASSY	
083	9-908-217-01	BRACKET SUB ASSY L/M	
084	9-908-220-01	WHEEL WORM	
087	9-908-375-01	BRACKET ASSY DEW	
088	9-908-374-01	GEAR PINCH (N)	
098	9-908-370-01	LEVER T-UP (N)	
400	9-908-503-01	PAN HEAD MACHINE	
402	9-908-238-01	SCREW SPECIAL	
404	9-908-239-01	SCREW CONE POINT 3X10	
408	9-908-171-01	BINDING HEAD MA	
411	9-908-163-01	SCREW SPECIAL (3X12)	
412	9-908-422-01	BINDING HEAD MA	
421	9-908-413-01	PAN HEAD MACHINE	
504	9-908-434-01	WASHER P S DE	
506	9-908-342-01	NUT NYLON M3	
508	9-908-998-01	NUT NYLON(M3)	
511	9-908-427-01	WASHER STOPPER	
512	9-908-434-01	WASHER STOPPER	

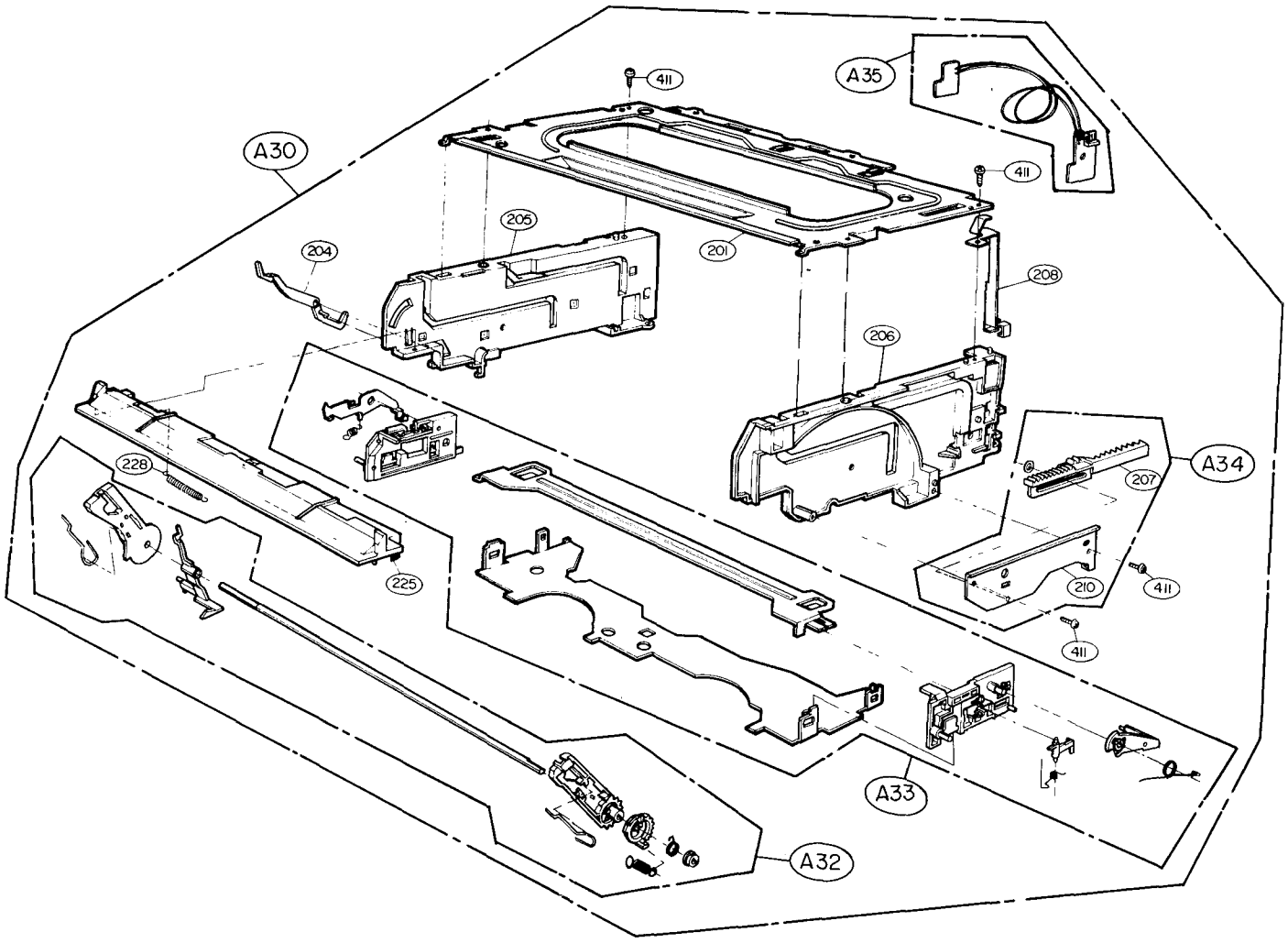
Moving Mechanism Section(Ⅱ)



REF NO	PART NO	DESCRIPTION	REMARK
A20	9-908-325-01	BRACKET ASSY BOTTOM	
A21	9-908-281-01	LEVER ASSY RAT	
A22	9-908-276-01	BRAKE ASSY CAP	
A23	9-908-179-01	ARM ASSY LOAD(R)	
A24	9-908-187-01	ARM ASSY LOAD(L)	
A25	9-908-294-01	PWB ASSY D-17,VCR	
110	9-908-381-01	CAM D17	
111	9-908-337-01	GEAR ASSY RACK F/L	
112	9-908-336-01	GEAR ASSY RACK T	
113	9-908-379-01	GEAR PC	
114	9-939-418-01	MOTOR CAPSTAN GVC-017S	
115	9-908-354-01	BELT CENTER	
116	9-908-367-01	PLATE F17	
117	9-908-368-01	SPRING FP	
121	9-908-280-01	SPRING CAPSTAN	
122	9-908-359-01	PULLEY GEAR POM 3G	
130	9-908-269-01	CLUTCH ASSY POM 7G FELT	
131	9-908-299-01	HOLDER LED(Q)	
132	9-908-298-01	HOLDER	
134	9-908-300-01	SWITCH MODE	
135	9-908-302-01	DIODE LED IR SENSOR EL-55L	

REF NO	PART NO	DESCRIPTION	REMARK
136	9-908-297-01	SENSOR SG-105(REEL) D-16KOC	
137	9-908-304-01	SWITCH ESE-105SV1	
138	9-908-180-01	GEAR LOAD(R)	
139	9-908-181-01	SPRING LOADING	
140	9-908-182-01	ARM SUB ASSY	
142	9-908-188-01	GEAR LOAD(L)	
143	9-908-189-01	SPRING LOADING	
144	9-908-190-01	ARM SUB ASSY (L)	
146	9-908-383-01	LEVER ASSY A-TEN	
150	9-908-397-01	BRACKET ASSY C-GUIDE	
400	9-908-503-01	PAN HEAD MACHINE	
401	9-908-245-01	PAN HEAD MACHINE	
411	9-908-163-01	SCREW SPECIAL (3X12)	
412	9-908-422-01	BINDING HEAD MA	
425	9-908-419-01	BRAIZER HD TAP	
426	9-908-420-01	PAN HEAD MACHINE	
503	9-908-426-01	WASHER STOPPER	
504	9-908-434-01	WASHER P.S D3	
505	9-908-434-01	WASHER STOPPER	
511	9-908-427-01	WASHER STOPPER	
512	9-908-434-01	WASHER STOPPER	

Front Loading Mechanism Section



REF NO	PART NO	DESCRIPTION	REMARK
A30	9-908-123-01	HOUSING ASSY	
A32	9-908-142-01	GEAR ASSY DRIVE	
A33	9-908-130-01	BRACKET ASSY CARRIER	
A34	9-908-164-01	BRACKET ASSY SIDE	
A35	9-909-882-01	PWB ASSY SENSOR	
201	9-908-129-01	PLATE TOP	
204	9-908-153-01	OPENER DOOR	
205	9-908-124-01	BRACKET LEFT (D17)	
206	9-908-125-01	BRACKET RIGHT (D17)	
207	9-908-167-01	GEAR RACK N/D	
208	9-908-126-01	PLATE GND TOP	
210	9-908-165-01	BRACKET SIDE	
225	9-908-127-01	GUIDE CST	
228	9-908-128-01	SPRING S/W	
411	9-908-163-01	SCREW SPECIAL (3X12)	

SECTION 12
ELECTRICAL PARTS LIST

NOTE

The components identified by shading and mark ⚠ are critical for safety
Replace only with part number specified

Les composants identifies par une frame et une marque ⚠ sont critiques pour la securite
Ne les remplacer que piece portant le numero specifie

- Items marked '*' are not stocked since they are seldom required for routine service Some delay should be anticipated when ordering these items
- All variable and adjustable resistors have characteristic curve ß unless otherwise noted

RESISTORS
- All resistors are in ohms
- F: nonflammable

When indicating parts by reference number, please include the board name

CAPACITORS
- MF: µF, PF: µµF

COILS
- UH, µH

REF NO	PART NO	DESCRIPTION	REMARK
	* 9-939-463-01	MA MOUNT COMPLETE (13V)	
	9-939-363-01	MA MOUNT COMPLETE (20V)	
		:::::::::::::::	
		<CAPACITOR>	
	9-939-278-01	CONNECTOR ASSY 3P (L=400)FOR SPEAKER	
C101	1-162-294-31	C,TUBULA(HIGH DIELE)	1000PF 50V K
C1101	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C1102	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C1103	1-101-004-00	C,CERAMIC(HIGH DIELE)	0 01MF 50V Z
C1107	1-106-351-00	C,POLYESTER(MYLAR)	2200pF 50V J
C1108	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1109	1-162-215-31	C,TUBULA(T C)	47PF 50V J
C1110	1-162-215-31	C,TUBULA(T C)	47PF 50V J
C1112	1-124-902-00	C,ELECTROLYTIC	0 47UF STD 50V M
C1115	1-126-967-11	C,ELECTROLYTIC	47UF STD 16V M
C1119	1-106-375-12	C,POLYESTER(MYLAR)	0 022MF 100V K
C1120	9-939-279-01	C,ELECTROLYTIC	1MF 50V M
C1121	1-162-217-31	C,TUBULA(T C)	56P 50V J
C1128	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C1131	1-162-197-31	C,TUBULA(T C)	6 8P 50V K
C1137	1-124-902-00	C,ELECTROLYTIC	0 47UF STD 50V M
C1144	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1145	9-939-389-01	C,ELECTROLYTIC	1000UF STD 10V M
C1152	9-939-291-01	C,POLYESTER(MYLAR)	0 1UF S 50V J
C1153	1-126-768-11	C,ELECTROLYTIC	2200UF STD 16V M
C1155	1-126-933-11	C,ELECTROLYTIC	100UF STD 16V M
C1202	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1206	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1207	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1208	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C1209	1-126-768-11	C,ELECTROLYTIC	2200UF STD 16V M
(20V)	1-126-934-11	C,ELECTROLYTIC	220UF STD 16V M
C1210	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1212	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1213	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1214	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1217	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1219	1-126-934-11	C,ELECTROLYTIC	220UF STD 16V M
C1220	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
(20V)	1-126-794-11	C,ELECTROLYTIC	4 7UF 50V M
C1251	1-104-792-51	C,ELECTROLYTIC	33UF 16V M
C13	1-102-959-00	C,CERAMIC(TEMP COMP)	22P 50V J
C14	1-102-959-00	C,CERAMIC(TEMP COMP)	22P 50V J

REF NO	PART NO	DESCRIPTION	REMARK
C1401	1-162-217-31	C,TUBULA(T C)	56PF 50V J
(20V)	1-162-201-31	C,TUBULA(T C)	12PF 50V J
C1402	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C1405	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C1432	1-126-967-11	C,ELECTROLYTIC	47UF STD 16V M
C1501	1-162-279-31	C,TUBULA(HIGH DIELE)	75PF 50V K
C1507	1-126-964-11	C,ELECTROLYTIC	10UF STD 16V M
C1508	1-124-499-11	C,ELECTROLYTIC	1UF SRE 50V M
C1509	1-126-964-11	C,ELECTROLYTIC	10UF STD 16V M
C16	1-162-286-31	C,TUBULA(HIGH DIELE)	220PF 50V K
C1601	1-126-935-11	C,ELECTROLYTIC	470UF STD 16V M
C1602	9-939-588-01	C,ELECTROLYTIC	330UF STD 16V M
(20V)	1-126-933-11	C,ELECTROLYTIC	100UF STD 16V M
C1603	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C1605	1-126-962-11	C,ELECTROLYTIC	3 3UF STD 50V M
C1606	1-126-942-61	C,ELECTROLYTIC	1000UF STD 25V M
C1607	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C1608	1-126-967-11	C,ELECTROLYTIC	47UF STD 16V M
C1616	1-106-375-12	C,POLYESTER(MYLAR)	0 022MF 100V K
C1627	1-106-371-00	C,POLYESTER(MYLAR)	0 015MF 100V K
C1701	1-124-347-00	C,ELECTROLYTIC	100M SM 160V M
C18	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C21	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C213	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C22	1-124-499-11	C,ELECTROLYTIC	1UF SRE 50V M
C220	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C221	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C223	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C224	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C225	1-126-964-11	C,ELECTROLYTIC	10UF STD 16V M
C227	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C229	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C23	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C230	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C26	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C27	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C28	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C29	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C31	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C32	1-124-465-00	C,ELECTROLYTIC	0 47UF 50V M
C33	9-939-394-01	C,GOLD CAP	47000MF/5 5V K
C37	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C38	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C40	1-162-294-31	C,TUBULA(HIGH DIELE)	1000PF 50V K
C402	1-126-786-11	C,ELECTROLYTIC	47UF 16V M

REF NO	PART NO	DESCRIPTION	REMARK
C405	1-161-494-00	C,TUBULA(HIGH DIELE)	22000P 25V Z F
C407	1-162-285-31	C,TUBULA(HIGH DIELE)	180PF 50V K
C409	9-939-289-01	C,TUBULA(HIGH DIELE)	0 1M 50V Z
C41	1-162-294-31	C,TUBULA(HIGH DIELE)	1000PF 50V K
C411	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C413	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C416	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C417	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C420	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C424	1-106-375-12	C,POLYESTER	0 022UF 100V K
C425	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C426	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C428	1-130-491-00	C,POLYESTER	0 047MF 50V K
C429	1-124-465-00	C,ELECTROLYTIC	0 47UF 50V M
C431	1-161-494-00	C,TUBULA(HIGH DIELE)	22000P 25V Z F
C432	1-130-483-00	C,POLYESTER	0 01UF 50V K
C433	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C434	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C436	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C437	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C44	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C443	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C444	9-939-289-01	C,TUBULA(HIGH DIELE)	0 1M 50V Z
C446	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C447	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C448	1-162-215-31	C,TUBULA(T C)	47PF 50V J
C450	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C451	1-102-942-00	C,CERAMIC(TEMP COMP)	5P 50V D
C453	1-162-209-31	C,TUBULA(T C)	27PF 50V J
C454	1-124-499-11	C,ELECTROLYTIC	1UF SRE 50V M
C456	1-124-257-00	C,ELECTROLYTIC	2 2UF 50V M
C457	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C458	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C459	9-939-289-01	C,TUBULA(HIGH DIELE)	0 1M 50V Z
C460	9-939-289-01	C,TUBULA(HIGH DIELE)	0 1M 50V Z
C501	1-162-294-31	C,TUBULA(HIGH DIELE)	1000PF 50V K
C502	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C503	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C506	1-130-483-00	C,POLYESTER	0 01UF 50V K
C508	9-939-290-01	C,POLYESTER(MYLAR)	0 033UF S 50V J
C509	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C51	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C511	1-162-294-31	C,TUBULA(HIGH DIELE)	1000PF 50V K
C515	9-939-290-01	C,POLYESTER(MYLAR)	0 033UF S 50V J
C516	1-124-499-11	C,ELECTROLYTIC	1UF SRE 50V M
C517	1-130-483-00	C,POLYESTER	0 01UF 50V K
C518	1-124-257-00	C,ELECTROLYTIC	2 2UF 50V M
C519	1-124-257-00	C,ELECTROLYTIC	2 2UF 50V M
C521	1-124-463-00	C,ELECTROLYTIC	0 1UF 50V M
C523	1-126-794-11	C,ELECTROLYTIC	4 7UF 50V M
C524	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C525	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C526	1-126-794-11	C,ELECTROLYTIC	4 7UF 50V M
C527	1-126-794-11	C,ELECTROLYTIC	4 7UF 50V M
C529	1-106-343-00	C,POLYESTER	1000PF 50V K
C530	1-104-792-51	C,ELECTROLYTIC	33UF 16V M
C532	1-126-514-11	C,ELECTROLYTIC	22UF 16V M
C534	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C535	9-939-395-01	C,ELECTROLYTIC	0 4700UF SRE 50V M
C537	1-106-351-00	C,POLYESTER(MYLAR)	2200PF S 50V J
C538	1-124-465-00	C,ELECTROLYTIC	0 47UF 50V M

REF NO	PART NO	DESCRIPTION	REMARK
C601	1-126-967-11	C,ELECTROLYTIC	47UF STD 16V M
C602	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C603	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C604	1-106-363-00	C,POLYESTER(MYLAR)	0 0068U 100V K
C605	1-106-375-12	C,POLYESTER(MYLAR)	0 022MF 100V K
C606	1-108-702-11	C,POLYESTER(MYLAR)	0 068U 100V K
C607	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C608	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C609	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C610	1-162-286-31	C,TUBULA(HIGH DIELE)	220PF 50V K
C611	1-124-903-11	C,ELECTROLYTIC	1UF STD 50V M
C613	1-126-967-11	C,ELECTROLYTIC	47UF STD 16V M
C614	1-106-345-00	C,POLYESTER(MYLAR)	0 0012U 100V J
C619	1-128-551-11	C,ELECTROLYTIC	22UF STD 16V M
C632	1-137-401-11	C,METALPOLYESTER	0 22MF 50V J
C634	1-126-935-11	C,ELECTROLYTIC	470UF STD 16V M
C636	1-106-343-00	C,POLYESTER(MYLAR)	0 001U 100V K
C637	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C638	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C639	1-126-964-11	C,ELECTROLYTIC	10UF STD 16V M
C640	1-126-964-11	C,ELECTROLYTIC	10UF STD 16V M
C801	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C805	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C807	9-939-291-01	C,POLYESTER(MYLAR)	0 1UF S 50V J
C808	1-126-157-11	C,ELECTROLYTIC	10UF 16V M
C810	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C811	9-939-291-01	C,POLYESTER(MYLAR)	0 1UF S 50V J
C820	1-130-493-00	C,POLYESTER	0 068MF 50V K
C821	1-106-363-00	C,POLYESTER(MYLAR)	6800PF S 50V J
C841	1-126-786-11	C,ELECTROLYTIC	47UF 16V M
C843	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C844	9-939-396-01	C,CERAMIC(TEMP COMP)	39P 50V J

<DIODE>

D10	8-719-815-85	DIODE	1S2471
D11	8-719-815-85	DIODE	1S2471
D1202	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1202	8-719-815-85	DIODE	1S2471
D1203	8-719-815-85	DIODE	1S2471
D1208	8-719-815-85	DIODE	1S2471
D1205	8-719-815-85	DIODE	1S2471
D21	8-719-815-85	DIODE	1S2471
D23	8-719-815-85	DIODE	1S2471
D401	8-719-815-85	DIODE	1S2471
D402	8-719-815-85	DIODE	1S2471
D403	8-719-815-85	DIODE	1S2471
D404	9-908-037-01	DIODE	SCHOTTKY,BAT 41
D405	8-719-815-85	DIODE	1S2471
D406	8-719-815-85	DIODE	1S2471
D407	8-719-815-85	DIODE	1S2471
D501	8-719-815-85	DIODE	1S2471
D502	8-719-815-85	DIODE	1S2471
D503	8-719-815-85	DIODE	1S2471
D506	8-719-815-85	DIODE	1S2471
D507	8-719-815-85	DIODE	1S2471
D508	8-719-815-85	DIODE	1S2471
D509	8-719-815-85	DIODE	1S2471
D510	8-719-815-85	DIODE	1S2471
D601	8-719-815-85	DIODE	1S2471
D602	8-719-815-85	DIODE	1S2471
D841	9-939-292-01	DIODE	DS4148
D842	9-939-292-01	DIODE	DS4148
D843	9-939-292-01	DIODE	DS4148

REF NO	PART NO	DESCRIPTION		REMARK
D844	8-719-815-85	DIODE	1S2471	
D845	8-719-815-85	DIODE	1S2471	
D846	8-719-815-85	DIODE	1S2471	
D847	8-719-815-85	DIODE	1S2471	
D848	8-719-815-85	DIODE	1S2471	
D849	8-719-815-85	DIODE	1S2471	
ZD11	8-719-921-67	DIODE ZENER	MTZ8 2B	
ZD1101	8-719-921-43	DIODE ZENER	MTZ5 1B	
ZD12	8-719-921-82	DIODE ZENER	Z12BM TA	
ZD1203	8-719-921-69	DIODE ZENER	MTZ9 1B	
ZD13	8-719-921-43	DIODE ZENER	MTZ5 1B	
ZD14	8-719-921-43	DIODE ZENER	MTZ5 1B	
ZD1401	8-719-921-69	DIODE ZENER	MTZ9 1B	
ZD1404	8-719-109-97	DIODE ZENER	MTZ6 8B	
ZD1405	8-719-921-69	DIODE ZENER	MTZ9 1B	
ZD1406	8-719-921-69	DIODE ZENER	MTZ9 1B	
ZD1506	8-719-921-43	DIODE ZENER	MTZ5 1B	
ZD1602	8-719-921-80	DIODE ZENER	MTZ 11B	
ZD1603	8-719-921-80	DIODE ZENER	MTZ 11B	
ZD203	8-719-921-80	DIODE ZENER	MTZ 11B	
ZD204	8-719-921-80	DIODE ZENER	MTZ 11B	
ZD205	8-719-921-82	DIODE ZENER	Z12BM TA	
ZD206	8-719-921-80	DIODE ZENER	MTZ 11B	
ZD207	8-719-921-80	DIODE ZENER	MTZ 11B	
ZD24	8-719-921-82	DIODE ZENER	Z12BM TA	

<IC>

IC10	9-939-295-01	IC, MOTOROLA	MC144110
IC11	9-939-296-01	IC, LG ELECTRON	GL7445 10SIP BI-MOTOR DRIVER
IC14	9-939-298-01	IC,KEC	KIA7033P 3P 3 3V RESET
IC15	8-759-251-04	IC,ATMEL	AT24C02-10PC 8D EEPROM(2K,IIC)
IC1501	9-939-299-01	IC,TOSHIBA	TA8825AN 56SD NTSC 1 CHIP(MONO
IC16	9-939-300-01	IC,MITSUBISHI	LG8658-02A(M38185ME-171FP)
IC17	9-939-298-01	IC,KEC	KIA7033P 3P 3 3V RESET
IC201	8-759-822-60	IC, SANYO	LA7222 (1280 AUDIO)
IC401	1-809-389-11	IC,SANYO	LC7975J 14D CCD 1H D/LINE(NTSC
IC402	9-939-304-01	IC,SANYO	LA7425 36SD Y/C(NTSC,VCR)
IC501	9-939-305-01	IC,HITACHI	HD49756NT 56SD 4HD SERVO
IC601	8-759-420-04	IC,SANYO	LA7620 28D VCR AUDIO PROCESS
IC602	8-759-420-04	IC,MATSUSHITA	AN5265
IC801	9-939-307-01	IC,ZILOG	Z86I2912PSC(CAPTION)DIP 18P
IC802	9-939-308-01	IC,MITSUBISHI	M35041-065FP 20SOP OSD

<JACK>

JK101	9-939-309-01	JACK,EARPHONE/AV FOR SONY
JK102	9-939-310-01	JACK,RCA 2P VIDEO;YL,AUDIO;BK

<COIL>

DL1204	9-908-973-01	COIL	DELAY LINE 48NS 3 58T
FL601	9-939-293-01	COIL	L/C FILTER(07S) LPF
J262	1-410-514-11	INDUCTOR	27UH K
L10	1-410-513-11	INDUCTOR	22UH K
L1102	9-939-311-01	COIL	CHOKE 0 79UH A 1105
L1105	9-939-399-01	INDUCTOR,	68UH K
L1107	1-410-363-11	INDUCTOR	27UH K
L1110	9-939-312-01	INDUCTOR	12UH K
L1111	1-410-511-11	INDUCTOR	15UH K
L1113	1-410-511-11	INDUCTOR	15UH K
L1114	1-410-511-11	INDUCTOR	15UH K
L1201	1-410-512-11	INDUCTOR	18UH K
(20V)	1-410-511-11	INDUCTOR	15UH K
L1221	9-939-314-01	COIL	SIF
L1222	9-939-315-01	COIL	VAR,07S 6D 45 75MHZ
L1223	9-939-316-01	COIL	VIF
L1501	1-410-508-11	INDUCTOR	8 2UH K

REF NO	PART NO	DESCRIPTION		REMARK
L204	1-410-513-11	INDUCTOR	22UH K	
L401	1-410-509-11	INDUCTOR	10UH K	
L402	1-410-518-11	INDUCTOR	56UH K	
L404	1-410-521-11	INDUCTOR	100UH K	
L405	1-410-514-11	INDUCTOR,	27UH K	
L406	1-410-521-11	INDUCTOR	100UH K	
L407	1-410-513-11	INDUCTOR	22UH K	
L408	1-410-513-11	INDUCTOR	22UH K	
L409	1-410-513-11	INDUCTOR	22UH K	
L410	1-410-515-11	INDUCTOR	33UH K	
L411	1-410-512-11	INDUCTOR	18UH K	
L412	1-410-363-11	INDUCTOR	27UH K	
L413	1-410-336-11	INDUCTOR	220UH K	
L501	1-410-514-11	INDUCTOR,	27UH K	
L601	1-410-521-11	INDUCTOR	100UH K	
L602	1-410-513-11	INDUCTOR	22UH K	
L603	1-410-521-11	INDUCTOR	100UH K	
L605	1-410-511-11	INDUCTOR	15UH K	
L802	1-410-513-11	INDUCTOR	22UH K	
L805	1-410-506-11	INDUCTOR	5 6UH K	
L811	1-410-336-11	INDUCTOR	220UH K	
L812	1-410-336-11	INDUCTOR	220UH K	
L813	1-410-336-11	INDUCTOR	220UH K	
L814	1-410-336-11	INDUCTOR	220UH K	
T601	9-939-342-01	COIL	VAR,07S 6F 252KHZ	

<CONNECTOR>

P01	9-939-400-01	CONNECTOR ASSY 3P (L=150) TO MF-R P01-A
P04	9-939-401-01	CONNECTOR ASSY 7P (L=200) TO MF-L P04-A
P11	9-939-324-01	CONNECTOR ASSY 15(3/12)P TO HC02/PD501
P508	9-939-329-01	CONNECTOR ASSY 15P TO PJM01

<TRANSISTOR>

Q10	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q11	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q1102	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q12	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q1201	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1202	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1203	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1205	8-729-140-96	TRANSISTOR	KTA1270-TP-Y (KTA562TM)KEC
Q1206	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1241	9-939-331-01	TRANSISTOR	KTC3197,TP(KTC388A),KEC
Q1252	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1501	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1502	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1503	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1504	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1506	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1521	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q201	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q202	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q203	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q401	8-729-201-53	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC
Q402	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q403	8-729-201-53	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC
Q404	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q405	8-729-201-53	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC
Q406	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q408	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q409	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q501	8-729-201-53	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC
Q502	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q503	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC

REF NO	PART NO	DESCRIPTION	REMARK
Q504	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q505	9-939-404-01	TRANSISTOR	KRA103M(AT) TO-92M TP KEC
Q506	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q507	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q508	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q601	8-729-803-86	TRANSISTOR	KTC3205-Y (KTC2236A) TP KEC
Q603	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q605	8-729-803-86	TRANSISTOR	KTA1273-Y TP(KTA966A) KEC
Q606	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q801	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q802	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q803	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q804	9-939-330-01	TRANSISTOR	KRC103M(AT) TO-92M TP KEC
Q841	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q842	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC

<RESISTOR>

FR1611	1-211-771-11	R,FUSIBLE	4 7 1/2W 5
R1	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5
R10	1-247-815-91	R,CARBON FILM	220 1/6W 5
R100	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R101	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R102	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R103	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R104	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R105	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R106	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R107	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5
R108	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R109	1-249-435-11	R,CARBON FILM	33K 1/6W 5
R11	1-247-815-91	R,CARBON FILM	220 1/6W 5
R110	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1103	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5
R1105	1-249-836-11	R,CARBON FILM	1 6K 1/6W 5
R1107	1-249-411-11	R,CARBON FILM	330 1/6W 5
R111	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5
R1111	1-247-816-11	R,CARBON FILM	240 1/6W 5
R1118	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5
R1119	1-247-858-11	R,CARBON FILM	13K 1/6W 5
R112	1-249-435-11	R,CARBON FILM	33K 1/6W 5
R1122	1-247-852-11	R,CARBON FILM	7 5K 1/6W 5
R1123	1-247-848-11	R,CARBON FILM	5 1K 1/6W 5
R1124	1-249-428-11	R,CARBON FILM	8 2K 1/6W 5
R1126	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1129	1-249-385-11	R,CARBON FILM	2 2 1/6W 5
R113	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1130	9-939-405-01	R,METAL FILM OXIDE	180 1W 5%
R1131	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1137	1-247-800-11	R,CARBON FILM	51 1/6W 5
R114	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R115	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1166	1-249-413-11	R,CARBON FILM	470 1/6W 5
R118	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R119	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R12	1-249-424-11	R,CARBON FILM	3 9K 1/6W 5
R120	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1200	9-939-406-01	R,CARBON FILM	680K 1/6W 5
R1201	1-249-413-11	R,CARBON FILM	470 1/6W 5
R1203	1-247-838-00	R,CARBON FILM	2 0K 1/6W 5
R1205	1-249-426-11	R,CARBON FILM	5 6K 1/6W 5
R1207	1-247-852-11	R,CARBON FILM	7 5K 1/6W 5
R1208	1-249-439-11	R,CARBON FILM	68K 1/6W 5
R1209	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5
R121	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1211	1-249-413-11	R,CARBON FILM	470 1/6W 5
R1212	1-249-836-11	R,CARBON FILM	1 6K 1/6W 5
R1213	1-249-836-11	R,CARBON FILM	1 6K 1/6W 5
R1216	1-249-431-11	R,CARBON FILM	15K 1/6W 5
(20V)	1-259-454-11	R,CARBON FILM	12K 1/6W 5

REF NO	PART NO	DESCRIPTION	REMARK
R1218	1-247-854-11	R,CARBON FILM	9 1K 1/6W 5
(20V)	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1219	1-247-854-11	R,CARBON FILM	9 1K 1/6W 5
R1221	1-249-433-11	R,CARBON FILM	20K 1/6W 5
R1222	1-214-840-00	R,CARBON FILM	100 1/2W 5
R1223	1-249-438-11	R,CARBON FILM	56K 1/6W 5
(20V)	1-249-434-11	R,CARBON FILM	27K 1/6W 5
R1224	1-247-883-11	R,CARBON FILM	150K 1/6W 5
(20V)	1-249-441-11	R,CARBON FILM	100K 1/6W 5
R1225	1-249-426-11	R,CARBON FILM	5 6K 1/6W 5
R1228	1-249-434-11	R,CARBON FILM	27K 1/6W 5
R1229	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5
R1230	1-249-436-11	R,CARBON FILM	39K 1/6W 5
(20V)	1-249-433-11	R,CARBON FILM	22K 1/6W 5
R1236	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5
R1237	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5
R1238	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5
(20V)	1-259-454-11	R,CARBON FILM	12K 1/6W 5
R1239	1-249-424-11	R,CARBON FILM	3 9K 1/6W 5
(20V)	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1251	1-249-435-11	R,CARBON FILM	33K 1/6W 5
R1252	1-249-427-11	R,CARBON FILM	6 8K 1/6W 5
R1253	1-249-428-11	R,CARBON FILM	8 2K 1/6W 5
(20V)	1-249-433-11	R,CARBON FILM	22K 1/6W 5
R1256	1-215-860-11	R,METAL FILM OXIDE	33 1W 5%
R1260	9-939-334-01	R,METAL FILM OXIDE	330 1/2W 5
R127	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1270	1-249-405-11	R,CARBON FILM	100 1/6W 5
R13	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R131	1-249-439-11	R,CARBON FILM	68K 1/6W 5
R14	1-249-441-11	R,CARBON FILM	100K 1/6W 5
R1401	1-249-428-11	R,CARBON FILM	8 2K 1/6W 5
R1403	1-247-818-11	R,CARBON FILM	300 1/6W 5
R1407	1-249-410-11	R,CARBON FILM	270 1/6W 5
R1411	1-249-413-11	R,CARBON FILM	470 1/6W 5
R143	1-214-840-00	R,CARBON FILM	100 1/2W 5
R1501	1-215-860-11	R,METAL FILM OXIDE	33 1W 5%
(20V)	1-216-424-11	R,METAL FILM OXIDE	39 1W 5%
R1503	1-249-413-11	R,CARBON FILM	470K 1/6W 5
(20V)	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1508	9-939-408-01	R,CARBON FILM	220 1/2W 5
R1521	9-939-589-01	R,CARBON FILM	3 6K 1/6W 5
(20V)	1-249-433-11	R,CARBON FILM	22K 1/6W 5
R1522	1-249-435-11	R,CARBON FILM	33K 1/6W 5
R1523	1-247-854-11	R,CARBON FILM	9 1K 1/6W 5
R1526	1-249-437-11	R,CARBON FILM	47K 1/6W 5
R1527	1-249-433-11	R,CARBON FILM	20K 1/6W 5
(20V)	1-247-866-11	R,CARBON FILM	30K 1/6W 5
R1530	1-247-842-11	R,CARBON FILM	3 0K 1/6W 5
(20V)	1-259-454-11	R,CARBON FILM	12K 1/6W 5
R1531	1-249-431-11	R,CARBON FILM	15K 1/6W 5
R1535	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1601	9-939-409-01	R,METAL FILM OXIDE	68 1W 5%
R1603	1-249-429-11	R,CARBON FILM	10K 1/6W 5
R1605	9-939-406-01	R,METAL FILM OXIDE	5 1 1/2W 5
R1606	9-939-410-01	R,METAL FILM OXIDE	5 1 1/2W 5
R1607	1-247-854-11	R,CARBON FILM	9 1K 1/6W 5
R1608	1-249-419-11	R,CARBON FILM	1 5K 1/6W 5
R1614	9-939-411-01	R,CARBON FILM	560 1/2W 5
R1619	1-249-426-11	R,CARBON FILM	5 6K 1/6W 5
R18	1-249-410-11	R,CARBON FILM	270 1/6W 5
R181	1-247-815-91	R,CARBON FILM	220 1/6W 5
R182	1-247-815-91	R,CARBON FILM	220 1/6W 5
R183	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R19	1-249-410-11	R,CARBON FILM	270 1/6W 5
R2	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5
R20	1-249-410-11	R,CARBON FILM	270 1/6W 5
R21	1-247-815-91	R,CARBON FILM	220 1/6W 5

REF NO	PART NO	DESCRIPTION		REMARK
R22	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R220	1-249-441-11	R,CARBON FILM	100K 1/6W 5	
R221	1-249-437-11	R,CARBON FILM	47K 1/6W 5	
R229	1-249-389-11	R,CARBON FILM	4 7 1/6W 5	
R23	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R26	1-249-439-11	R,CARBON FILM	68K 1/6W 5	
R28	1-249-439-11	R,CARBON FILM	68K 1/6W 5	
R31	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R35	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R36	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R38	1-249-438-11	R,CARBON FILM	56K 1/6W 5	
R39	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R4	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R40	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R409	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R41	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R415	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R419	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R421	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R423	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5	
R431	1-249-418-11	R,CARBON FILM	1 2K 1/6W 5	
R432	1-249-431-11	R,CARBON FILM	15K 1/6W 5	
R434	1-259-418-11	R,CARBON FILM	390 1/6W 5	
R435	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R437	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R48	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R5	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R501	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R502	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R503	1-249-431-11	R,CARBON FILM	15K 1/6W 5	
R504	1-249-441-11	R,CARBON FILM	100K 1/6W 5	
R505	1-249-441-11	R,CARBON FILM	100K 1/6W 5	
R506	1-249-434-11	R,CARBON FILM	27K 1/6W 5	
R507	1-249-435-11	R,CARBON FILM	33K 1/6W 5	
R508	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R509	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R510	1-249-414-11	R,CARBON FILM	560 1/6W 5	
R511	1-249-414-11	R,CARBON FILM	560 1/6W 5	
R513	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R518	1-249-426-11	R,CARBON FILM	5 6K 1/6W 5	
R519	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R521	1-247-897-11	R,CARBON FILM	560K 1/6W 5	
R523	1-259-454-11	R,CARBON FILM	12K 1/6W 5	
R524	1-249-432-11	R,CARBON FILM	18K 1/6W 5	
R525	1-249-433-11	R,CARBON FILM	22K 1/6W 5	
R529	1-249-436-11	R,CARBON FILM	39K 1/6W 5	
R53	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R532	1-247-881-00	R,CARBON FILM	120K 1/6W 5	
R538	1-249-414-11	R,CARBON FILM	560 1/6W 5	
R539	1-249-414-11	R,CARBON FILM	560 1/6W 5	
R544	1-249-437-11	R,CARBON FILM	47K 1/6W 5	
R545	1-249-441-11	R,CARBON FILM	100K 1/6W 5	
R546	1-249-426-11	R,CARBON FILM	5 6K 1/6W 5	
R547	1-249-436-11	R,CARBON FILM	39K 1/6W 5	
R550	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R552	1-247-903-00	R,CARBON FILM	1 0M 1/6W 5	
R58	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R59	1-249-441-11	R,CARBON FILM	100K 1/6W 5	
R60	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R606	1-249-393-11	R,CARBON FILM	10 1/6W 5	
R609	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	

REF NO	PART NO	DESCRIPTION		REMARK
R61	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R612	1-249-401-11	R,CARBON FILM	47 1/6W 5	
R614	1-249-404-11	R,CARBON FILM	82 1/6W 5	
R62	1-249-426-11	R,CARBON FILM	5 6K 1/6W 5	
R625	1-249-435-11	R,CARBON FILM	33K 1/6W 5	
R63	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R632	1-249-436-11	R,CARBON FILM	39K 1/6W 5	
R638	1-249-435-11	R,CARBON FILM	33K 1/6W 5	
R639	1-249-393-11	R,CARBON FILM	10 1/6W 5	
R64	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R645	1-249-393-11	R,CARBON FILM	10 1/6W 5	
R65	1-247-791-91	R,CARBON FILM	22 1/6W 5	
R66	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R67	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R69	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R70	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R71	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R74	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R75	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R76	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R77	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R78	9-939-339-01	R,METAL FILM OXIDE	1 6 1/2W 5	
R79	9-939-339-01	R,METAL FILM OXIDE	1 6 1/2W 5	
R80	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R806	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R815	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R816	1-249-417-11	R,CARBON FILM	1.0K 1/6W 5	
R822	1-249-441-11	R,CARBON FILM	100K 1/6W 5	
R823	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R827	1-214-753-00	R,METAL FILM	10K 1/6W 1	
R842	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R846	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R847	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R848	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R849	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5	
R850	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R856	1-249-437-11	R,CARBON FILM	47K 1/6W 5	
R857	1-247-887-00	R,CARBON FILM	220K 1/6W 5	
R858	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R859	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R89	1-249-413-11	R,CARBON FILM	470 1/6W 5	
R90	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R91	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R92	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R93	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R94	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R95	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R96	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R97	1-247-815-91	R,CARBON FILM	220 1/6W 5	
R98	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
R99	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5	
VR1201	1-241-763-11	R,HORI	RH0638CS3R2HB B472	
VR1204	1-238-016-11	R,HORI	RH0638C14R31B B103	
VR1316	9-939-415-01	R,SEMI-FIX(H)	EVN-DJAA03 B103	
VR1431	1-238-016-11	R,HORI	RH0638C14R31B B103	
VR401	9-939-343-01	R,HORI	RH0638C13R2DB B102	
VR501	1-241-767-21	R,SEMI-FIX(H)	EVN-DJAA03 B104	
VR601	9-939-344-01	R,SEMI-FIX(H)	EVN-DJAY03 B204	

<SWITCH>

SW11	1-571-532-21	SWITCH	TACT VERT
SW12	1-571-532-21	SWITCH	TACT VERT

REF NO	PART NO	DESCRIPTION	REMARK
SW13	1-571-532-21	SWITCH	TACT VERT
SW14	1-571-532-21	SWITCH	TACT VERT
SW15	1-571-532-21	SWITCH	TACT VERT
SW1501	9-908-991-01	SWITCH	SVC P12T21

<MISCELLANEOUS>

TU1101	9-939-340-01	TUNER	TUGH9-A07A
X10	9-939-345-01	FILTER	CST6 00MGW-TF01
X11	9-939-346-01	CRYSTAL	32 7680KHZ +-10PPM
X1401	1-577-706-11	FILTER	RESO CSB503F30 503 5
X1501	9-939-347-01	CRYSTAL	3 579545 16PF 90 OHM
X401	9-939-348-01	CRYSTAL	3 579545 90 OHM
Z1101	9-939-349-01	FILTER	SAW,M1958M
Z1102	9-939-350-01	FILTER	B P FILTER SFSH4 5MCB-TF21
Z1103	9-939-351-01	FILTER	TRAP TPS4 5MC-TF21

* 9-939-462-01 D MOUNT COMPLETE (13V)
9-939-359-01 D MOUNT COMPLETE (20V)

<CAPACITOR>

C1219	9-939-390-01	C,PP	200V 0 022UF K
C1221	1-102-157-00	C,CERAMIC(HIGH DIELE)	560PF 500V K
C1222	1-126-952-11	C,ELECTROLYTIC	1000UF STD 16V M
C1300	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C1301	1-106-371-00	C,POLYESTER(MYLAR)	0 015MF 100V K
C1302	1-124-903-11	C,ELECTROLYTIC	1UF KU 50V M
C1303	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C1304	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C1305	1-106-385-00	C,POLYESTER(MYLAR)	0 0560UF 100V J
C1306	1-126-943-11	C,ELECTROLYTIC	2200UF STD 25V M
C1307	1-126-962-11	C,ELECTROLYTIC	3 3UF STD 50V M
C1307	9-939-392-01	C,ELECTROLYTIC	3 3UF KU 50V M
C1308	9-939-291-01	C,POLYESTER(MYLAR)	0 1UF S 50V J
C1310	1-126-933-11	C,ELECTROLYTIC	100UF STD 16V M
C1311	1-126-969-11	C,ELECTROLYTIC	220UF STD 50V M
C1313	1-102-157-00	C,CERAMIC(HIGH DIELE)	560PF 500V K
C1314	1-126-952-11	C,ELECTROLYTIC	1000UF STD 35V M
C1317	1-126-967-11	C,ELECTROLYTIC	47UF STD 50V M
C1403	1-106-355-12	C,POLYESTER(MYLAR)	0 0033U 100V K
C1410	1-107-618-11	C,CERAMIC(HIGH DIELE)	180P 500V K
C1411	1-164-646-11	C,CERAMIC(HIGH DIELE)	2200PF 500V K
C1412 ⚠	9-939-283-01	C,MPP	160V 0 0047UF H
C1413 ⚠	9-939-281-01	C,MPP	160V 0 0033UF H
C1414	1-165-127-11	C,CERAMIC(HIGH DIELE)	470PF 500V K
C1415 ⚠	9-939-282-01	C,MPP	200V 0 39UF J
C1416	1-126-772-11	C,ELECTROLYTIC	1UF STD 250V M
C1417	1-126-967-11	C,ELECTROLYTIC	47UF STD 50V M
C1419	9-939-393-01	C,ELECTROLYTIC	250V 4 7UF T HR (85)
C1420	9-909-475-01	C,CERAMIC(HI-K)	2200PF 2KV
C1428 ⚠	1-126-964-11	C,ELECTROLYTIC	10UF STD 50V M
C1800 ⚠	9-939-287-01	C,METAL POLYESTOR	AC 125V 0 1UF M
C1801 ⚠	9-939-285-01	C,METAL POLYESTOR	AC 125V 0 1UF M
C1802	9-939-284-01	CAPACITOR	1KV B 2200PF K
C1803	9-939-284-01	CAPACITOR	1KV B 2200PF K
C1804	9-939-284-01	CAPACITOR	1KV B 2200PF K
C1805	9-939-284-01	CAPACITOR	1KV B 2200PF K
C1806	9-939-420-01	C,ELECTROLYTIC	450V 220UF M
C1807	1-136-539-11	C,POLYPROPYLENE	800V 0 0022MF J
C1808	1-164-645-11	C,CERAMIC(HIGH DIELE)	1000PF 500V K
C1809	1-124-667-11	C,ELECTROLYTIC	10UF STD 100V M
C1810	1-104-665-11	C,ELECTROLYTIC	100UF STD 25V M
C1811	1-126-934-11	C,ELECTROLYTIC	220UF STD 16V M
C1812	1-165-127-11	C,CERAMIC(HIGH DIELE)	470PF 500V K
C1813	1-164-646-11	C,CERAMIC(HIGH DIELE)	2200PF 500V K
C1814	1-124-667-11	C,ELECTROLYTIC	10UF STD 100V M
C1815	1-107-641-11	C,ELECTROLYTIC	220UF STD 160V M
C1816	1-128-563-11	C,ELECTROLYTIC	100UF STD 100V M
C1817	9-908-970-01	C,CERAMIC(HIGH DIELE)	1200P 500V K
C1818	1-126-953-11	C,ELECTROLYTIC	2200UF STD 35V M
C1819	1-126-942-61	C,ELECTROLYTIC	1000UF STD 25V M
C1820	1-165-127-11	C,CERAMIC(HIGH DIELE)	470PF 500V K
C1821	1-165-127-11	C,CERAMIC(HIGH DIELE)	470PF 500V K
C1822	1-126-951-11	C,ELECTROLYTIC	470UF STD 35V M
C1823	1-126-953-11	C,ELECTROLYTIC	2200UF STD 35V M
C1824	1-126-964-11	C,ELECTROLYTIC	10UF STD 50V M
C1825 ⚠	9-939-431-00	C,DE7150	F SC 0 01UF
C1826	1-106-220-00	C,POLYESTER(MYLAR)	0 1MF 100V L
C1827	1-106-367-00	C,POLYESTER(MYLAR)	0 01U 100V K
C1829	9-939-287-01	C,POLYESTER(MYLAR)	0 47UF S 50V J
C1830 ⚠	9-939-431-00	C,DE7150	F SC 0 01UF
C1831	1-126-963-11	C,ELECTROLYTIC	4 7UF STD 50V M
C1832	9-909-477-01	C,DE1710-798	4700PF 1K K
C1833	1-126-934-11	C,ELECTROLYTIC	220UF STD 16V M
C1834	1-104-664-11	C,ELECTROLYTIC	47UF STD 25V M
C1835	1-126-934-11	C,ELECTROLYTIC	220UF STD 16V M
C1837	1-126-934-11	C,ELECTROLYTIC	220UF STD 16V M
C1838	1-126-940-11	C,ELECTROLYTIC	330UF STD 25V M

<DIODE>

D1302	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1304	8-719-300-33	DIODE	RU-2MV
D1305	8-719-815-85	DIODE	1S2471
D1307	8-719-815-85	DIODE	1S2471
D1308	8-719-815-85	DIODE	1S2471
D1403 ⚠	8-719-300-80	DIODE	RU-1A V
D1405	8-719-300-80	DIODE	RU-1A V
D1410	8-719-815-85	DIODE	1S2471
D1415	8-719-018-11	DIODE	ESIF
D1802	8-719-304-63	DIODE	RM11AV 1 2A/600V 100A
D1803	8-719-300-33	DIODE	GP15J (1 5A/600V)
D1804	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1805	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1806	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1807	8-719-300-70	DIODE	EH-1ZV
D1809	8-719-300-33	DIODE	RU3AMV
D1810	8-719-961-04	DIODE	RGP10J
D1811	9-908-006-01	DIODE	FML-G12S
D1812	8-719-961-04	DIODE	RGP10J
D1813	9-908-006-01	DIODE	FML-G12S
D1814	8-719-961-04	DIODE	RGP10J
D1816	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1817	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1818	8-719-815-85	DIODE	1S2471
D1819	8-719-815-85	DIODE	1S2471
D1820	8-719-815-85	DIODE	1S2471
D1821	8-719-815-85	DIODE	1S2471
D1824	8-719-304-63	DIODE	RM11AV 1 2A/600V 100A
D1825	8-719-304-63	DIODE	RM11AV 1 2A/600V 100A
D1826	8-719-304-63	DIODE	RM11AV 1 2A/600V 100A
D1828	8-719-300-33	DIODE	TVR06J 0 6A/600V 250NS
D1829	8-719-815-85	DIODE	1S2471
D1830	8-719-815-85	DIODE	1S2471
D1831	8-719-815-85	DIODE	1S2471
ZD1304	8-719-921-63	DIODE ZENER	MTZ7.5B
ZD1364 ⚠	8-719-982-30	DIODE ZENER	MTZ30B
ZD1365 ⚠	8-719-982-30	DIODE ZENER	MTZ30B
ZD1366 ⚠	8-719-109-97	DIODE ZENER	MTZ6.8B
ZD1403	8-719-982-03	DIODE ZENER	MTZ3 6B
ZD1808	8-719-109-97	DIODE ZENER	MTZ6 8B
ZD1815	8-719-921-80	DIODE ZENER	MTZ 11B

REF NO	PART NO	DESCRIPTION	REMARK
ZD1818	8-719-921-49	DIODE ZENER	MTZ6 2B
ZD1820	8-719-921-80	DIODE ZENER	MTZ 11B
ZD1821	8-719-982-03	DIODE ZENER	MTZ3 6B
ZD1822	8-719-110-41	DIODE,ZENER	MTZ15B TP ROHM
ZD1833	8-719-982-26	DIODE ZENER	MTZ 33B
ZD1850	8-719-110-41	DIODE,ZENER	MTZ15B TP ROHM

<FERRITE CORE>

FB1301	1-412-911-11	CORE	FERRITE BFD3565R2F
FB1402	1-408-105-00	CORE	FERRITE 1UH
FB1801	1-408-105-00	CORE	FERRITE 1UH
FB1802	1-408-105-00	CORE	FERRITE 1UH
FB1803	1-412-911-11	CORE	FERRITE BFD3565R2F
FB1804	1-412-911-11	CORE	FERRITE BFD3565R2F

<FUSE>

F1801	⚠1-532-705-00	FUSE	125V 4A TIME LAG
F1802	⚠9-939-294-01	FUSE	MICRO 125V 4.0A
F1803	⚠9-939-294-01	FUSE	MICRO 125V 4.0A
F1804	9-939-294-01	FUSE	MICRO 125V 4 0A

<IC>

IC1301	9-939-297-01	IC,TOSHIBA	TA8445K 12S 2 2A R/G+V OUT
IC1801	8-749-924-XX	IC,SANKEN	STR/S6707(LF953) 9P (R5,R6)
IC1802	⚠9-939-301-01	IC,SHARP	PC817X3 4D PHOTO COUPLER
IC1803	⚠9-939-301-01	IC,SHARP	PC817X3 4D PHOTO COUPLER
IC1804	⚠8-749-921-88	IC,SANKEN	SE115N(LF12) 3P 115V ERROR AMP
IC1806	9-939-302-01	IC,KEC	KIA7806PI TO-220IS 6V,1A
IC1807	9-939-303-01	IC,KEC	KIA7812PI 3P(TO-220IS) 12V,1A
IC1809	9-939-303-01	IC,KEC	KIA7812PI 3P(TO-220IS) 12V,1A

<COIL>

L1402	⚠9-906-676-01	COIL	H LINEARITY 570UH
L1403	9-939-317-01	COIL	CHOKE 6800UH R 1218
L1404	1-410-514-11	INDUCTOR,	27UH K
L1701	9-939-319-01	COIL	CHOKE 82UH R1217
L1801	⚠9-939-326-01	COIL	LINE FILTER SQE2930 18-01
L1803	9-939-319-01	COIL	CHOKE 82UH R1217
T1401	⚠9-939-341-01	TRANSFORMER	H-DRIVE,EI-19 PULSE
T1402	⚠9-907-091-01	FBT	FCK2-14M5X
(20V)	⚠9-908-699-01	FBT	FCK1-21MP*20/QA120 3 40
T1801	⚠9-939-414-01	TRANSFORMER	SMPS COIL EER4245 STR-S6707 K

<CONNECTOR>

P1401A	9-939-325-01	CONNECTOR ASSY 10P (L=300) TO MA P1401B
P1801	⚠9-936-327-01	CORD POWER,KBW-3818 (PER HOUSING L=350)
P1803A	9-939-328-01	CONNECTOR ASSY 12P(L=300) TO MA P1803B
P1804	9-939-403-01	CONNECTOR ASSY 1P 200MM TO MA P1101

<TRANSISTOR>

Q1401	8-729-232-26	TRANSISTOR	KTC1027-Y(KTC2235),KEC
(20V)	9-936-295-01	TRANSISTOR	KTC3229(KTC2068),KEC
Q1402	9-939-593-01	TRANSISTOR	KTD2499
(20V)	8-729-821-87	TRANSISTOR	2SD1878
Q1801	8-729-025-04	TRANSISTOR	2SC3852A SANKEN
Q1802	8-729-206-81	TRANSISTOR	KTA968A-Y KEC
Q1803	8-719-803-82	TRANSISTOR	KTC3228-0 TP(KTC2383),KEC
Q1804	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1805	8-719-803-82	TRANSISTOR	KTC3228-0 TP(KTC2383),KEC
Q1806	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1807	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1808	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1809	8-729-201-53	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC
Q1810	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1811	8-729-140-96	TRANSISTOR	KTC3227-Y,TP(KTC1627A),KEC
Q1812	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1813	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1814	⚠8-729-803-76	TRANSISTOR	KTA1024-Y TP(KTC3403),KEC
Q1815	8-719-803-82	TRANSISTOR	KTC3228-0 TP(KTC2383),KEC
Q1816	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1817	8-729-206-81	TRANSISTOR	KTA968A-Y KEC
Q1818	8-729-281-53	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC
Q1850	8-729-037-08	TRANSISTOR	KTD2058-Y KEC

<RELAY>

RL1801	⚠9-909-333-01	RELAY	SZR-G5-AP 12VDC(G5S)
RL1802	⚠9-909-333-01	RELAY	SZR-G5-AP 12VDC(G5S)

<RESISTOR>

FR1241	1-217-418-00	R,FUSIBLE	0 47 1/2W 5
FR1315	1-217-418-00	R,FUSIBLE	0 47 1/2W 5
FR1417	⚠1-217-416-00	R,FUSIBLE	0 47 1/2W 5
FR1422	1-217-198-01	R,FUSIBLE	0 68 2W 5%
(20V)	9-909-899-01	R,FUSIBLE	1 60 2W 5%
FR1423	1-217-418-00	R,FUSIBLE	0 47 1/2W 5
FR1428	1-260-100-11	R,FUSIBLE	1 2K 1/2W 5
FR1429	1-260-100-11	R,FUSIBLE	1 2K 1/2W 5
FR1806	1-260-100-11	R,FUSIBLE	1 2K 1/2W 5%
FR1810	1-212-982-00	R,FUSIBLE	100 1/2W 5%
FR1827	1-217-198-01	R,FUSIBLE	0 68 2W 5%
FR1829	1-249-478-11	R,FUSIBLE	1/2W 2 2 J
FR1838	9-939-460-01	R,FUSIBLE	1 0 2W 5%
(20V)	1-217-198-01	R,FUSIBLE	0 68 2W 5%
R1215	9-933-000-01	R,CARBON FILM	91K 1/2W 5
R1217	1-249-433-11	R,CARBON FILM	20K 1/6W 5
R1235	1-249-435-11	R,CARBON FILM	33K 1/6W 5
R1247	1-260-124-11	R,CARBON FILM	120K 1/2W 5
(20V)	9-933-000-01	R,CARBON FILM	91K 1/2W 5
R1301	1-249-424-11	R,CARBON FILM	3 9K 1/6W 5
R1302	1-247-842-11	R,CARBON FILM	3 0K 1/6W 5
R1304	1-249-428-11	R,CARBON FILM	8 2K 1/6W 5
R1306	1-215-428-00	R,METAL FILM	2K 1/6W 5
R1307	1-247-860-11	R,CARBON FILM	16K 1/6W 5
R1308	9-939-594-01	R,METAL FILM	15K 1/6W 1%
R1310	1-249-484-11	R,CARBON FILM	6 8 1/2W 5
R1311	1-249-484-11	R,CARBON FILM	6 8 1/2W 5
R1312	9-939-407-01	R,METAL FILM OXIDE	560 1/2W 5
R1313	9-939-407-01	R,METAL FILM OXIDE	560 1/2W 5
R1315	1-260-099-11	R,CARBON FILM	1 0K 1/2W 5
R1320	1-247-848-11	R,CARBON FILM	5 1K 1/6W 5
R1323	9-910-999-31	R,CARBON FILM	150 1/2W 5
R1324	1-214-862-00	R,CARBON FILM	820K 1/2W 5
(20V)	1-247-754-11	R,CARBON FILM	1 5K 1/2W 5
R1325	1-260-072-11	R,CARBON FILM	4 7 1/2W 5
R1405	1-249-436-11	R,CARBON FILM	39K 1/6W 5
R1411	1-215-891-11	R,METAL FILM OXIDE	680 2W 5%
R1413	1-260-105-11	R,CARBON FILM	3 3K 1/2W 5
R1414	1-259-036-11	R,CARBON FILM	15 1/2W 5
R1415	1-260-097-11	R,CARBON FILM	680 1/2W 5
R1416	1-249-657-11	R,METAL FILM OXIDE	220 1/2W 5
R1418	⚠1-247-417-11	R,CARBON FILM	1.0K 1/6W 5
(20V)	⚠1-247-830-11	R,CARBON FILM	910 1/6W 5
R1421	9-939-595-01	R,METAL FILM	2 2K 1/2W 5
(20V)	1-249-377-11	R,METAL FILM	0 68 1/2W 5
R1426	1-249-413-11	R,CARBON FILM	470 1/6W 5
R1427	⚠1-247-838-00	R,CARBON FILM	2.0K 1/6W 5
R1428	⚠1-249-414-11	R,CARBON FILM	560 1/6W 5
R1431	1-247-838-00	R,CARBON FILM	2.0K 1/6W 5
R1803	⚠1-207-665-00	R,FW RECT G	3W 1.0 J (NOT RELESED)
R1803	1-215-875-11	R,METAL FILM OXIDE	10K 1W 5%
R1804	1-249-420-11	R,CARBON FILM	1 8K 1/6W 5
R1805	1-249-417-11	R,CARBON FILM	1 0K 1/6W 5
R1807	9-939-336-01	R,METAL FILM OXIDE	20 2W 5%
R1808	9-908-989-01	R,PRW	2W 0 22 OHM J
R1810	⚠9-939-327-01	RESISTOR	ERC13UC4R22V(CE)
R1811	1-249-421-11	R,METAL FILM	2 2K 1/4W 2
R1812	1-215-857-11	R,METAL FILM OXIDE	10 1W 5%
R1813	1-215-902-11	R,METAL FILM OXIDE	47K 1W 5%

REF NO	PART NO	DESCRIPTION		REMARK
R1814	1-260-099-11	R,CARBON FILM	1 0K 1/2W 5	
R1815	1-247-271-00	R,CARBON FILM	20K 1/2W 5	
R1816	1-249-437-11	R,CARBON FILM	47K 1/6W 5	
R1817	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R1818	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R1819	1-259-454-11	R,CARBON FILM	12K 1/6W 5	
R1820	1-249-421-11	R,CARBON FILM	2 2K 1/6W 5	
R1821	1-249-422-11	R,CARBON FILM	2 7K 1/6W 5	
R1822	1-249-423-11	R,CARBON FILM	3 3K 1/6W 5	
R1823	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R1824	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R1825	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R1826	1-207-672-00	R,RW RECT G	5W 2 2 J DOUBLE	
R1829	1-249-427-11	R,CARBON FILM	6 8K 1/6W 5	
R1830	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R1831	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R1832	9-939-412-01	R,CARBON FILM	1 6K 1/2W 5	
R1833	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R1834	1-249-425-11	R,CARBON FILM	4 7K 1/6W 5	
R1835	1-249-432-11	R,CARBON FILM	18K 1/6W 5	
R1836	1-249-433-11	R,CARBON FILM	22K 1/6W 5	
R1837	1-260-111-00	R,CARBON FILM	10K 1/2W 5	
R1838	9-910-999-31	R,CARBON FILM	150 1/2W 5	
R1839	1-222-396-00	R,CARBON COMPOSITION	4.7M 1/2W	
R1840	9-939-412-01	R,CARBON FILM	1 6K 1/2W 5	
R1843	1-259-454-11	R,CARBON FILM	12K 1/6W 5	
R1844	1-249-406-11	R,CARBON FILM	120 1/6W 5	
R1845	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R1846	1-249-429-11	R,CARBON FILM	10K 1/6W 5	
R1849	1-259-418-11	R,CARBON FILM	390 1/6W 5	
R1850	1-259-418-11	R,CARBON FILM	390 1/6W 5	

<MISCELLANEOUS>

SW1301	9-908-991-01	SWITCH	SVC P12T21
TH1901	9-908-899-01	THERMISTOR	PTH471402BQ 5RO 361A0
VA1901	9-908-905-01	VARISTOR	SVC 361D 14A

* 9-939-461-01 C MOUNT COMPLETE (13V)
9-939-358-01 C MOUNT COMPLETE (20V)

<CAPACITOR>

C1901	1-162-292-31	C,TUBULA(HIGH DIELE)	680P 50V K
C1902	1-162-292-31	C,TUBULA(HIGH DIELE)	680P 50V K
C1903	1-162-292-31	C,TUBULA(HIGH DIELE)	680P 50V K
C1904	1-136-203-11	C,POLY PROPYLNE	0 01 630V
(20V)	9-904-475-01	C,CERAMIC(HI-K)	2200PF 2KV

<DIODE>

D1907	8-719-815-85	DIODE	1S2471
D1908	8-719-815-85	DIODE	1S2471
D1909	8-719-815-85	DIODE	1S2471

<CONNECTOR>

P1501	9-939-326-01	CONNECTOR ASSY	8P TO MA P1501-A
P1504	9-939-402-01	CONNECTOR ASSY	4P (L=250) TO D P1504-A

<TRANSISTOR>

Q1901	9-936-295-01	TRANSISTOR	KTC3229 (KTC2068),KEC
Q1902	9-936-295-01	TRANSISTOR	KTC3229 (KTC2068),KEC
Q1903	9-936-295-01	TRANSISTOR	KTC3229 (KTC2068),KEC

<RESISTOR>

R1901	1-249-404-11	R,CARBON FILM	82 1/6W 5
R1902	1-247-812-11	R,CARBON FILM	160 1/6W 5
R1903	1-247-812-11	R,CARBON FILM	160 1/6W 5
R1904	1-247-812-11	R,CARBON FILM	160 1/6W 5
R1905	1-249-419-11	R,CARBON FILM	1 5K 1/6W 5
R1906	1-249-419-11	R,CARBON FILM	1 5K 1/6W 5
R1907	1-249-419-11	R,CARBON FILM	1 5K 1/6W 5
R1908	1-247-754-11	R,CARBON FILM	1 5K 1/2W 5
R1909	1-247-754-11	R,CARBON FILM	1 5K 1/2W 5
R1910	1-247-754-11	R,CARBON FILM	1 5K 1/2W 5
R1911	1-216-463-00	R,METAL FILM OXIDE	12K 2W 5%
R1912	1-216-463-00	R,METAL FILM OXIDE	12K 2W 5%
R1913	1-216-463-00	R,METAL FILM OXIDE	12K 2W 5%
R1914	1-202-846-11	R,CARBON FILM	470K 1/2W 5
R1915	1-202-838-11	R,CARBON FILM	100K 1/2W 5
R1916	1-202-848-11	R,CARBON FILM	680K 1/2W 5
R1917	1-249-731-11	R,CARBON FILM	270K 1/2W 5
R1918	1-214-921-00	R,CARBON FILM	220K 1/2W 5
R1919	1-249-405-11	R,CARBON FILM	100 1/6W 5
VR1901	1-241-760-11	R,HORI	RH0638CN2R0PB B331
VR1902	1-241-760-11	R,HORI	RH0638CN2R0PB B331
VR1903	1-241-763-11	R,HORI	RH0638CS3R2HB B472
VR1904	1-241-763-11	R,HORI	RH0638CS3R2HB B472
VR1905	1-241-763-11	R,HORI	RH0638CS3R2HB B472
VR1907	1-230-641-11	R,HORI	RH092GDJ6J1AA(2 2M)
VR1908	1-230-641-11	R,HORI	RH092GDJ6J1AA(2 2M)

* 9-939-364-01 RP MOUNT COMPLETE

<CAPACITOR>

C701	1-124-455-00	C,ELECTROLYTIC	100UF 16V M
C702	9-939-289-01	C,TUBULA(HIGH DIELE)	0 1M 50V Z
C703	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C704	1-126-301-11	C,ELECTROLYTIC	1UF 50V M
C705	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C709	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C710	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C711	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C712	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C713	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C714	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C717	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C718	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C719	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C720	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M
C723	1-162-600-11	C,TUBULA(HIGH DIELE)	4700PF 16V X
C731	1-162-217-31	C,TUBULA(TC)	56P 50V J
C732	1-162-215-31	C,TUBULA(TC)	47PF 50V J
C733	1-162-288-31	C,TUBULA(HIGH DIELE)	330P 50V K
C734	1-162-284-31	C,TUBULA(HIGH DIELE)	150P 50V K
C735	1-162-219-31	C,TUBULA(TC)	68P 50V J
C736	1-162-306-11	C,TUBULA(HIGH DIELE)	0 01MF 16V M

<IC>

IC701	1-810-534-11	IC,SANYO	LA7416 30SD 4HD AMP(VCR)

<INDUCTOR>

L701	1-410-521-11	INDUCTOR	100UH K
L731	1-410-508-11	INDUCTOR	8 2UH K
L732	1-410-513-11	INDUCTOR	22UH K
L733	1-410-520-11	INDUCTOR	82UH K
L734	9-939-322-01	INDUCTOR	270UH K

<RESISTOR>

R701	9-939-413-01	R,CARBON FILM	75K 1/6W 5
R703	1-249-433-11	R,CARBON FILM	20K 1/6W 5
R704	1-249-433-11	R,CARBON FILM	20K 1/6W 5
R723	1-249-435-11	R,CARBON FILM	33K 1/6W 5
R731	1-249-413-11	R,CARBON FILM	470 1/6W 5
R732	1-249-414-11	R,CARBON FILM	560 1/6W 5
R733	1-249-419-11	R,CARBON FILM	1 5K 1/6W 5
R734	1-249-419-11	R,CARBON FILM	1 5K 1/6W 5
R735	1-259-418-11	R,CARBON FILM	390 1/6W 5

REF NO	PART NO	DESCRIPTION	REMARK
		* 9-939-365-01 MF LEFT MOUNT COMPLETE	
		<CAPACITOR>	
C01	1-126-786-11	C,ELECTROLYTIC 47UF 16V M	
		<LED>	
D01	9-939-397-01	DIODE,LED DL-11S2RN1 OPTO	
D02	9-939-397-01	DIODE,LED DL-11S2RN1 OPTO	
D03	9-939-397-01	DIODE,LED DL-11S2RN1 OPTO	
		<PRE-AMP>	
RC01	9-939-332-01	PRE-AMP ORC-40S	
		<RESISTOR>	
R85	1-249-423-11	R,CARBON FILM 3 3K 1/6W 5	
R86	1-249-420-11	R,CARBON FILM 1 8K 1/6W 5	
R87	1-249-427-11	R,CARBON FILM 6 8K 1/6W 5	
R88	1-249-432-11	R,CARBON FILM 18K 1/6W 5	
		<SWITCH>	
SW6	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW7	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW8	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW9	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW10	1-572-200-11	SWITCH TACT 2LEAD HORI	
		* 9-939-367-01 MF RIGHT MOUNT COMPLETE	
		<RESISTOR>	
R81	1-249-418-11	R,CARBON FILM 1 2K 1/6W 5	
R82	1-249-420-11	R,CARBON FILM 1 8K 1/6W 5	
R83	1-249-423-11	R,CARBON FILM 3 3K 1/6W 5	
R84	1-249-427-11	R,CARBON FILM 6 8K 1/6W 5	
		<SWITCH>	
SW1	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW2	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW3	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW4	1-572-200-11	SWITCH TACT 2LEAD HORI	
SW5	1-572-200-11	SWITCH TACT 2LEAD HORI	
		<ACCESSORIES>	
A1	9-939-214-01	INSTUCTION MANUAL (ENG/SPA)	
A1	9-939-215-01	INSTUCTION MANUAL (ENG/FRN)	
A2	1-473-626-11	REMOTE CONTROLLER(RM-Y138)	
A2	1-473-626-21	REMOTE CONTROLLER(RM-Y138W)	
A3	9-908-072-01	ADAPTER,ANT	

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